

**CHAPTER**

**49**

**AUXILIARY POWER  
UNIT**



**737-600/700/800/900  
AIRCRAFT MAINTENANCE MANUAL**

**CHAPTER 49  
AUXILIARY POWER UNIT**

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1 thru 8	Jun 15/2009		916	Jun 10/2005		232	Oct 15/2008	
			917	Jun 10/2005		233	Oct 15/2008	
49-CONTENTS			918	Jun 10/2005		234	Oct 15/2008	
1	Feb 15/2008		919	Jun 10/2005		235	Oct 15/2008	
2	Feb 15/2008		920	Jun 10/2005		236	Oct 15/2008	
3	Feb 15/2009		921	Jun 10/2005		237	Oct 15/2008	
4	Feb 15/2008		922	Jun 10/2005		238	BLANK	
O 5	Jun 15/2009		49-11-00			49-11-00		
O 6	Jun 15/2009		201	Oct 10/2003		401	Feb 15/2009	
7	Feb 15/2008		202	Feb 10/2007		R 402	Jun 15/2009	
8	Feb 15/2009		203	Oct 10/2003		R 403	Jun 15/2009	
9	Oct 15/2008		204	Oct 10/2003		404	Feb 15/2009	
10	Feb 15/2008		205	Oct 10/2003		405	Feb 15/2009	
11	Feb 15/2008		206	Oct 10/2003		406	Feb 15/2009	
12	Feb 15/2008		207	Oct 10/2003		407	Feb 15/2009	
13	Feb 15/2009		208	Feb 10/2005		408	Feb 15/2009	
14	Feb 15/2009		209	Jun 15/2008		409	Feb 15/2009	
15	Feb 15/2009		210	Feb 15/2009		410	Oct 10/2005	
16	Feb 15/2009		R 211	Jun 15/2009		411	Oct 10/2005	
17	Feb 15/2009		R 212	Jun 15/2009		412	Oct 10/2005	
18	Feb 15/2009		O 213	Jun 15/2009		413	Oct 10/2005	
19	Feb 15/2009		O 214	Jun 15/2009		414	Oct 10/2005	
20	BLANK		215	Feb 10/2005		415	Oct 10/2005	
49-00-00			216	Feb 10/2005		416	Oct 10/2005	
901	Oct 15/2008		217	Feb 10/2005		417	Oct 10/2005	
902	Jun 10/2005		218	Feb 10/2005		418	Oct 10/2005	
903	Oct 10/2003		219	Feb 10/2005		419	Oct 10/2005	
904	Oct 10/2003		220	Feb 10/2005		420	Oct 10/2005	
905	Oct 10/2003		221	Feb 10/2005		R 421	Jun 15/2009	
906	Oct 10/2003		222	Feb 15/2008		R 422	Jun 15/2009	
907	Oct 10/2003		223	Feb 10/2005		423	Feb 15/2009	
908	Oct 10/2003		224	Feb 10/2005		424	Feb 15/2009	
909	Jun 10/2005		225	Feb 10/2005		425	Feb 15/2009	
910	Jun 10/2005		226	Feb 10/2005		426	Feb 15/2009	
911	Jun 10/2005		227	Oct 15/2008		427	Feb 15/2009	
912	Jun 10/2005		228	Oct 15/2008		428	Feb 15/2009	
913	Jun 10/2005		229	Oct 15/2008		429	Feb 15/2009	
914	Jun 10/2005		230	Oct 15/2008		430	Feb 15/2009	
915	Jun 10/2005		231	Oct 15/2008		431	Feb 15/2009	

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# 49-EFFECTIVE PAGES



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49-11-00 (cont)			49-11-00			49-11-01 (cont)		
432	Feb 15/2009		601	Oct 10/2003		605	Feb 10/2004	
433	Feb 15/2009		602	Oct 10/2003		606	BLANK	
434	Feb 15/2009		603	Feb 15/2009		49-11-01		
435	Feb 15/2009		604	Feb 15/2009		801	Oct 10/2006	
436	Feb 15/2009		605	Feb 15/2009		802	Jun 10/2004	
437	Feb 15/2009		606	Oct 10/2004		803	Oct 10/2003	
438	Feb 15/2009		607	Oct 10/2003		804	Oct 10/2006	
439	Feb 15/2009		608	Oct 10/2004		805	Jun 10/2005	
440	Feb 15/2009		609	Oct 10/2004		806	Jun 10/2004	
441	Feb 15/2009		610	BLANK		807	Oct 10/2006	
442	Feb 15/2009		49-11-00			808	BLANK	
443	Feb 15/2009		801	Feb 15/2009		49-11-02		
444	Feb 15/2009		802	Oct 15/2008		201	Oct 10/2007	
445	Feb 15/2009		803	Oct 15/2008		202	Oct 10/2007	
446	Feb 15/2009		804	Oct 10/2007		203	Oct 10/2007	
447	Feb 15/2009		49-11-01			204	Oct 10/2007	
448	Feb 15/2009		401	Oct 10/2003		205	Oct 10/2003	
449	Feb 15/2009		402	Jun 10/2005		206	Oct 10/2003	
450	Feb 15/2009		403	Oct 10/2003		207	Oct 10/2003	
451	Feb 15/2009		404	Oct 10/2003		208	Oct 10/2003	
452	Feb 15/2009		405	Feb 15/2009		209	Oct 10/2003	
453	Feb 15/2009		406	Jun 10/2007		210	Oct 10/2003	
454	Feb 15/2009		407	Jun 10/2005		211	Oct 10/2006	
455	Feb 15/2009		408	Jun 10/2005		212	Jun 10/2004	
456	Feb 15/2009		409	Oct 10/2003		213	Jun 10/2004	
457	Feb 15/2009		410	Oct 10/2003		214	Jun 10/2004	
458	Feb 15/2009		411	Oct 10/2003		49-13-11		
459	Feb 15/2009		412	Oct 10/2003		401	Jun 10/2005	
460	Feb 15/2009		413	Oct 10/2003		402	Jun 10/2005	
461	Feb 15/2009		414	Oct 10/2003		403	Jun 10/2005	
462	BLANK		415	Oct 10/2003		404	Jun 10/2005	
49-11-00			416	Feb 15/2009		405	Oct 10/2003	
501	Feb 10/2007		417	Oct 15/2008		406	Oct 10/2003	
502	Feb 15/2009		418	Oct 15/2008		407	Oct 10/2003	
503	Feb 15/2009		49-11-01			408	Oct 10/2003	
504	Feb 15/2009		601	Oct 10/2003		409	Oct 10/2003	
505	Feb 10/2007		602	Oct 10/2003		410	Feb 15/2009	
506	Feb 15/2009		603	Jun 10/2005		411	Feb 15/2009	
			604	Jun 10/2005		412	Feb 15/2009	

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49-13-11 (cont)			49-15-15			49-15-23 (cont)		
413	Feb 15/2009		R 401	Jun 15/2009		403	Feb 15/2009	
414	Feb 15/2009		O 402	Jun 15/2009		404	Jun 10/2007	
415	Feb 15/2009		O 403	Jun 15/2009		49-15-31		
416	Feb 15/2009		R 404	Jun 15/2009		401	Oct 10/2003	
49-13-11			R 405	Jun 15/2009		402	Jun 10/2005	
601	Feb 15/2009		R 406	Jun 15/2009		403	Oct 10/2003	
602	Feb 15/2009		R 407	Jun 15/2009		404	Oct 10/2003	
603	Feb 15/2009		R 408	Jun 15/2009		405	Feb 15/2009	
604	Feb 15/2009		O 409	Jun 15/2009		406	Jun 10/2007	
605	Feb 15/2009		O 410	Jun 15/2009		49-15-41		
606	Oct 10/2003		R 411	Jun 15/2009		401	Feb 15/2009	
607	Oct 10/2003		O 412	Jun 15/2009		402	Jun 10/2005	
608	BLANK		R 413	Jun 15/2009		403	Oct 10/2004	
49-15-00			R 414	Jun 15/2009		404	Feb 15/2009	
501	Oct 10/2003		R 415	Jun 15/2009		405	Oct 15/2008	
502	Oct 10/2003		R 416	Jun 15/2009		406	Jun 10/2005	
503	Oct 10/2003		R 417	Jun 15/2009		49-16-11		
504	Oct 10/2007		O 418	Jun 15/2009		301	Feb 15/2008	
505	Oct 10/2003		O 419	Jun 15/2009		302	Jun 10/2006	
506	Oct 10/2003		O 420	BLANK		303	Jun 10/2006	
507	Oct 10/2003		49-15-22			304	Oct 10/2003	
508	Feb 15/2009		301	Feb 15/2009		49-16-11		
509	Oct 10/2005		302	Feb 15/2009		601	Feb 15/2009	
510	Oct 10/2005		303	Feb 15/2009		602	Feb 15/2009	
511	Oct 10/2005		304	Jun 10/2007		603	Feb 10/2004	
512	Oct 10/2005		305	Feb 15/2009		604	BLANK	
513	Oct 10/2005		306	BLANK		49-16-11		
514	BLANK		49-15-22			701	Feb 15/2009	
49-15-11			401	Oct 10/2005		702	Feb 15/2009	
401	Jun 10/2005		402	Oct 10/2005		703	Oct 15/2008	
402	Oct 10/2003		403	Feb 15/2008		704	Oct 15/2008	
403	Feb 15/2009		404	Oct 10/2003		705	Oct 15/2008	
404	Oct 15/2008		405	Feb 15/2009		706	Oct 15/2008	
49-15-11			406	Oct 15/2008		707	Oct 15/2008	
601	Feb 15/2009		407	Jun 15/2008		708	Oct 15/2008	
602	Feb 15/2009		408	BLANK		709	Oct 10/2003	
603	Feb 15/2009		49-15-23			710	Oct 10/2003	
604	Feb 15/2009		401	Oct 10/2003		711	Oct 10/2003	
			402	Oct 10/2003		712	Oct 10/2003	

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49-16-12			49-17-11			49-21-00 (cont)		
401	Feb 15/2008		601	Feb 15/2009		622	Oct 10/2005	
402	Jun 10/2006		602	Feb 15/2009		623	Oct 10/2005	
403	Oct 10/2003		603	Feb 15/2009		624	Oct 10/2005	
404	Feb 15/2009		604	Feb 15/2009		625	Oct 10/2005	
405	Jun 15/2008		605	Feb 15/2009		626	Jun 15/2008	
406	Jun 15/2008		606	BLANK		627	Feb 10/2007	
49-16-12			49-17-11			628	Jun 15/2008	
701	Feb 15/2009		801	Oct 15/2008		629	Jun 15/2008	
702	BLANK		802	Oct 10/2004		630	Jun 15/2008	
49-17-11			49-17-12			631	Jun 15/2008	
401	Jun 10/2005		O 601	Jun 15/2009		632	Oct 10/2005	
402	Oct 10/2003		602	Feb 15/2009		633	Oct 10/2005	
403	Jun 10/2005		49-21-00			634	BLANK	
404	Jun 10/2005		201	Feb 15/2009		49-21-00		
405	Jun 10/2005		202	Jun 10/2005		R 701	Jun 15/2009	
406	Jun 10/2005		203	Jun 10/2005		R 702	Jun 15/2009	
407	Jun 10/2005		204	Oct 10/2003		703	Oct 15/2008	
408	Oct 10/2003		49-21-00			704	Oct 15/2008	
409	Oct 10/2003		601	Jun 15/2008		705	Jun 10/2004	
410	Oct 10/2003		602	Feb 10/2007		R 706	Jun 15/2009	
411	Oct 10/2003		603	Feb 10/2007		707	Jun 10/2004	
412	Oct 10/2003		604	Feb 10/2007		708	BLANK	
413	Oct 10/2003		605	Feb 10/2007		49-31-00		
414	Oct 10/2003		606	Feb 10/2007		201	Feb 15/2008	
415	Oct 10/2003		607	Feb 10/2007		202	Jun 10/2006	
416	Oct 10/2003		608	Jun 15/2008		203	Jun 10/2006	
417	Oct 10/2003		609	Jun 15/2008		204	Jun 10/2006	
418	Feb 15/2009		610	Oct 10/2005		205	Oct 10/2003	
419	Feb 15/2009		611	Oct 10/2005		206	Oct 10/2003	
420	Feb 15/2009		612	Oct 10/2005		207	Oct 10/2003	
421	Feb 15/2009		613	Oct 10/2005		208	Jun 10/2006	
422	Feb 15/2009		614	Oct 10/2005		209	Jun 10/2006	
423	Feb 15/2009		615	Oct 10/2005		210	Oct 10/2003	
424	Feb 15/2009		616	Oct 10/2005		49-31-11		
425	Feb 15/2009		617	Oct 10/2005		401	Feb 15/2008	
426	Feb 15/2009		618	Oct 10/2005		402	Jun 10/2006	
427	Feb 15/2009		619	Oct 10/2005		403	Jun 10/2006	
428	Feb 15/2009		620	Oct 10/2005		404	Oct 10/2003	
			621	Oct 10/2005		405	Oct 10/2003	

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49-31-11 (cont)			49-31-16 (cont)			49-41-51 (cont)		
406	Feb 15/2009		410	Oct 15/2008		602	Feb 15/2009	
407	Oct 15/2008		49-31-21			603	Oct 10/2003	
408	Oct 15/2008		401	Feb 15/2009		604	Oct 10/2003	
409	Oct 15/2008		402	Feb 15/2009		49-41-51		
410	BLANK		403	Oct 10/2003		701	Oct 10/2004	
49-31-11			404	Feb 15/2009		702	BLANK	
601	Feb 15/2009		405	Feb 15/2009		49-41-52		
602	Feb 15/2009		406	Feb 15/2009		401	Oct 10/2003	
603	Oct 10/2003		49-41-21			402	Jun 10/2005	
604	BLANK		R 401	Jun 15/2009		403	Oct 10/2003	
49-31-14			402	Oct 10/2005		404	Feb 15/2009	
401	Feb 15/2008		403	Oct 10/2005		405	Oct 15/2008	
402	Jun 10/2006		404	Oct 10/2005		406	BLANK	
403	Oct 10/2003		405	Oct 10/2003		49-41-52		
404	Feb 15/2009		406	Oct 10/2003		601	Oct 10/2003	
405	Jun 10/2005		407	Oct 10/2007		602	BLANK	
406	Oct 10/2003		R 408	Jun 15/2009		49-41-52		
49-31-14			409	Feb 15/2009		701	Oct 10/2004	
601	Oct 10/2003		410	Oct 15/2008		702	BLANK	
602	BLANK		411	Oct 15/2008		49-41-61		
49-31-15			412	Oct 15/2008		401	Oct 10/2007	
401	Feb 15/2008		413	Oct 15/2008		402	Jun 10/2005	
402	Jun 10/2006		414	Oct 15/2008		403	Feb 15/2009	
403	Jun 10/2006		49-41-31			404	Oct 10/2003	
404	Oct 10/2003		401	Oct 10/2003		405	Oct 10/2003	
405	Oct 10/2003		402	Jun 10/2005		406	Feb 15/2009	
406	Feb 15/2009		403	Oct 10/2003		407	Jun 15/2008	
407	Oct 15/2008		404	Feb 15/2009		408	Feb 15/2009	
408	Oct 15/2008		405	Oct 10/2003		409	Oct 10/2006	
49-31-16			406	BLANK		410	BLANK	
401	Feb 15/2008		49-41-51			49-41-71		
402	Jun 10/2006		401	Feb 15/2009		401	Oct 10/2003	
403	Oct 10/2003		402	Feb 15/2009		402	Jun 10/2005	
404	Oct 10/2003		403	Oct 10/2003		403	Oct 10/2003	
405	Feb 15/2009		404	Feb 15/2009		404	Feb 15/2009	
406	Oct 15/2008		405	Feb 15/2009		405	Oct 10/2003	
407	Oct 15/2008		406	BLANK		406	Jun 15/2008	
408	Feb 15/2009		49-41-51			407	Jun 15/2008	
409	Oct 15/2008		601	Feb 15/2009		408	Jun 15/2008	

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Subject/Page	Date	COC	Subject/Page	Date	COC	Subject/Page	Date	COC
49-52-11			49-52-32			49-61-00 (cont)		
401	Oct 10/2003		401	Oct 10/2003		217	Feb 15/2009	
402	Jun 10/2007		402	Jun 10/2005		218	Feb 15/2009	
403	Jun 10/2007		403	Oct 10/2003		219	Feb 15/2009	
404	Feb 15/2009		404	Feb 15/2009		220	Feb 15/2009	
405	Oct 15/2008		405	Oct 10/2003		221	Feb 15/2009	
406	Oct 15/2008		406	Oct 10/2003		222	Feb 15/2009	
49-52-12			49-52-33			223	Feb 15/2009	
401	Feb 15/2008		401	Oct 10/2003		224	BLANK	
402	Feb 15/2009		402	Jun 10/2005		49-61-12		
403	Feb 15/2009		403	Oct 10/2003		401	Feb 15/2009	
404	Oct 10/2003		404	Feb 15/2009		402	Feb 10/2007	
405	Oct 10/2003		405	Oct 15/2008		403	Feb 15/2009	
406	Feb 15/2009		406	Oct 15/2008		404	Feb 10/2007	
407	Feb 15/2009		49-52-41			405	Feb 15/2009	
408	Oct 15/2008		401	Feb 15/2008		406	Feb 15/2009	
409	Oct 15/2008		402	Jun 10/2006		49-61-21		
410	BLANK		403	Oct 10/2003		401	Oct 10/2003	
49-52-12			404	Oct 10/2003		402	Jun 10/2005	
501	Feb 15/2009		405	Feb 15/2009		403	Oct 10/2003	
502	Oct 15/2008		406	Oct 15/2008		404	Feb 15/2009	
503	Oct 15/2008		407	Oct 15/2008		405	Oct 15/2008	
504	Oct 10/2003		408	Oct 15/2008		406	Oct 15/2008	
49-52-13			49-61-00			49-61-31		
401	Oct 10/2003		201	Feb 15/2009		401	Oct 10/2003	
402	Jun 10/2005		202	Feb 15/2009		402	Jun 10/2005	
403	Oct 10/2003		203	Feb 15/2009		403	Oct 10/2003	
404	Feb 15/2009		204	Jun 15/2008		404	Feb 15/2009	
405	Oct 15/2008		205	Jun 15/2008		405	Oct 15/2008	
406	Oct 15/2008		206	Feb 15/2009		406	BLANK	
49-52-31			207	Jun 15/2008		49-71-11		
401	Oct 10/2003		208	Jun 15/2008		401	Jun 10/2005	
402	Jun 10/2005		R 209	Jun 15/2009		402	Oct 10/2003	
403	Oct 10/2003		210	Oct 10/2005		403	Feb 15/2009	
404	Oct 10/2003		211	Feb 15/2009		404	Oct 10/2003	
405	Feb 15/2009		212	Feb 15/2009		49-71-21		
406	Oct 15/2008		213	Feb 15/2009		401	Oct 10/2003	
407	Jun 10/2005		214	Feb 15/2009		402	Jun 10/2005	
408	BLANK		215	Feb 15/2009		403	Oct 10/2003	
			216	Feb 15/2009		404	Feb 15/2009	

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49-71-21 (cont)			49-81-13			49-91-12 (cont)		
405	Oct 15/2008		801	Oct 15/2008		403	Jun 10/2005	
406	BLANK		802	Oct 15/2008		404	Oct 10/2003	
49-72-11			803	Oct 15/2008		405	Feb 15/2009	
401	Oct 10/2003		804	Jun 10/2006		406	Oct 15/2008	
402	Jun 10/2005		49-81-31			407	Oct 15/2008	
403	Oct 10/2003		401	Oct 10/2003		408	Jun 10/2007	
404	Feb 15/2009		402	Jun 10/2005		409	Jun 10/2007	
405	Jun 10/2007		403	Oct 10/2003		410	Feb 15/2009	
406	BLANK		R 404	Jun 15/2009		411	Oct 15/2008	
49-81-11			405	Jun 10/2005		412	Oct 15/2008	
401	Oct 10/2003		406	BLANK		49-91-13		
402	Jun 10/2005		49-81-41			301	Oct 10/2004	
403	Oct 10/2003		601	Feb 15/2009		302	Oct 10/2004	
404	Oct 10/2003		602	Feb 15/2009		49-91-13		
405	Feb 15/2009		603	Oct 10/2003		401	Oct 15/2008	
406	Jun 10/2005		604	BLANK		402	Jun 10/2005	
407	Feb 15/2009		49-91-11			403	Oct 10/2003	
408	BLANK		401	Oct 15/2008		404	Feb 15/2009	
49-81-11			402	Feb 15/2009		405	Jun 10/2005	
601	Feb 15/2009		403	Jun 10/2007		406	Feb 15/2009	
602	Feb 15/2009		404	Jun 10/2007		407	Feb 15/2009	
603	Feb 15/2009		405	Oct 10/2003		408	BLANK	
604	Feb 15/2009		406	Oct 10/2003		49-91-13		
605	Feb 10/2006		407	Feb 15/2009		601	Feb 15/2009	
606	BLANK		408	Oct 15/2008		602	Feb 15/2009	
49-81-11			409	Oct 15/2008		603	Oct 10/2003	
701	Oct 15/2008		410	Feb 15/2009		604	BLANK	
702	Jun 10/2005		411	Oct 15/2008		49-91-21		
703	Jun 10/2005		412	Oct 15/2008		401	Feb 15/2009	
704	BLANK		413	Feb 15/2009		402	Oct 15/2008	
49-81-12			414	Oct 15/2008		403	Oct 15/2008	
701	Feb 15/2009		415	Oct 15/2008		404	Jun 10/2007	
702	Feb 15/2009		416	BLANK		405	Jun 10/2007	
703	Feb 15/2009		49-91-11			406	Feb 15/2009	
704	Oct 10/2003		601	Feb 15/2009		407	Oct 15/2008	
49-81-13			602	Feb 15/2009		408	Oct 15/2008	
601	Feb 15/2009		49-91-12			49-91-41		
602	Feb 15/2009		401	Oct 15/2008		401	Oct 10/2003	
			402	Oct 10/2003		402	Jun 10/2005	

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403	Jun 10/2005		605	Jun 10/2005				
404	Oct 10/2003		606	Oct 10/2003				
405	Feb 15/2009		607	Oct 10/2003				
406	Oct 15/2008		608	Oct 10/2003				
407	Oct 15/2008		49-94-11					
408	BLANK		401	Oct 10/2003				
49-91-41			402	Jun 10/2005				
601	Feb 15/2009		403	Oct 10/2003				
602	Oct 15/2008		404	Feb 15/2009				
603	Oct 15/2008		405	Oct 15/2008				
604	Oct 15/2008		406	Oct 15/2008				
605	Oct 10/2003		49-94-21					
606	BLANK		401	Oct 10/2003				
49-91-71			402	Jun 10/2005				
401	Oct 10/2003		403	Oct 10/2003				
402	Jun 10/2005		404	Feb 15/2009				
403	Oct 10/2003		405	Oct 15/2008				
404	Oct 10/2003		406	Oct 10/2003				
R 405	Jun 15/2009		49-94-22					
406	Jun 10/2005		401	Oct 10/2003				
407	Oct 10/2003		402	Jun 10/2005				
408	BLANK		403	Oct 10/2003				
49-91-71			404	Feb 15/2009				
601	Feb 15/2009		405	Oct 15/2008				
602	Feb 15/2009		406	Oct 15/2008				
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A = Added, R = Revised, D = Deleted, O = Overflow, C = Customer Originated Change

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Data Memory Module Installation TASK 49-72-11-400-801			404	HAP ALL
<u>EXHAUST DUCT MUFFLER - REMOVAL/ INSTALLATION</u>	49-81-11		401	HAP ALL
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# AIRCRAFT MAINTENANCE MANUAL

## AIRBORNE AUXILIARY POWER - DDG MAINTENANCE PROCEDURES

### 1. General

- A. This procedure has the maintenance tasks for the Master Minimum Equipment List (MMEL) maintenance requirements as shown in the Dispatch Deviations Procedures Guide (DDG). These tasks prepare the airplane for flight with systems/components that are inoperative.
- B. This procedure also has the tasks that put the airplane back to its usual condition.
- C. These are the tasks for the systems/components in the airborne auxiliary power system:
  - (1) MMEL 49-1 (DDPG) Preparation - APU Inoperative
  - (2) MMEL 49-1 (DDPG) Restoration - APU Inoperative
  - (3) MMEL 49-4 (DDPG) Preparation - APU Annunciator MAINT Light On or Inoperative
  - (4) MMEL 49-4 (DDPG) Restoration - APU Annunciator MAINT Light On or Inoperative
  - (5) MMEL 49-5 (DDPG) Preparation - APU Exhaust Gas Temperature Indicator Inoperative
  - (6) MMEL 49-5 (DDPG) Restoration - APU Exhaust Gas Temperature Indicator Inoperative
  - (7) MMEL 49-6 (DDPG) Preparation - APU Air Inlet Door Inoperative
  - (8) MMEL 49-6 (DDPG) Restoration - APU Air Inlet Door Inoperative
  - (9) MMEL 49-7 (DDPG) Preparation - APU Bleed Air System Inoperative
  - (10) MMEL 49-7 (DDPG) Restoration - APU Bleed Air System Inoperative
  - (11) MMEL 49-15 (DDPG) Preparation - Start Power Unit Inoperative
  - (12) MMEL 49-15 (DDPG) Restoration - Start Power Unit Inoperative
  - (13) MMEL 49-16 (DDPG) Preparation - Start Converter Unit Inoperative
  - (14) MMEL 49-16 (DDPG) Restoration - Start Converter Unit Inoperative

### **TASK 49-00-00-040-801**

### 2. MMEL 49-1 (DDPG) Preparation - APU Inoperative

(Figure 901)

#### A. General

- (1) This task gives the steps to prepare the airplane for flight with the APU inoperative. To prepare the airplane for flight with the APU inoperative, you must deactivate the APU master switch and do a visual check of the APU fuel shutoff valve.
- (2) If the APU INOP tag is installed because of an APU start problem and there are other APU starts on the ground, you must do a visual inspection of the tailcone and flight control surfaces.

#### B. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
211	Flight Compartment - Left

#### C. Procedure

SUBTASK 49-00-00-860-001

- (1) Make sure the APU master switch [12] on the P5 forward overhead panel is OFF and install an APU INOP tag.

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SUBTASK 49-00-00-860-002

(2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT
B	14	C01424	AUX POWER UNIT SCU FAN POWER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

SUBTASK 49-00-00-010-001

(3) Get access to the APU fuel shutoff valve [17].

**NOTE:** The APU fuel shutoff valve is on the rear spar of the left wing in the wheel well.

SUBTASK 49-00-00-860-003

(4) Make sure the APU fuel shutoff valve [17] is fully closed.

**NOTE:** The manual override handle [16] on the APU fuel shutoff valve gives an OPEN or CLOSED indication of the shutoff valve position.

(a) If the APU fuel shutoff valve [17] is not fully closed, turn the manual override handle [16] to the CLOSED position.

SUBTASK 49-00-00-210-002

(5) If it is necessary, examine the tailcone and flight control surfaces for signs of heat damage, delamination or paint blistering.

**NOTE:** You must examine the tailcone and flight control surfaces if there is one or more APU starts on the ground and the APU did not start.

(a) If you find signs of heat damage, delamination or paint blistering, do the repair procedure in the structural repair manual before the subsequent airplane flight.

————— **END OF TASK** —————

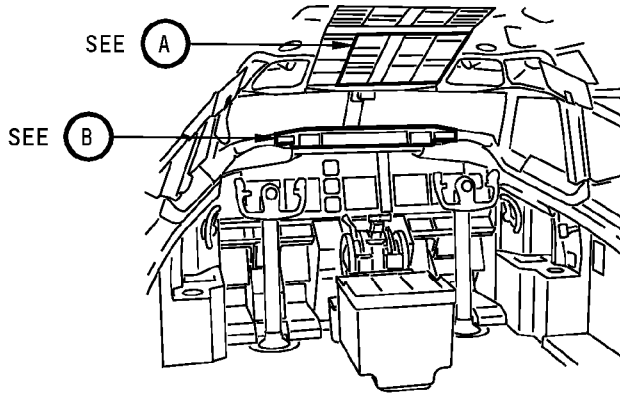
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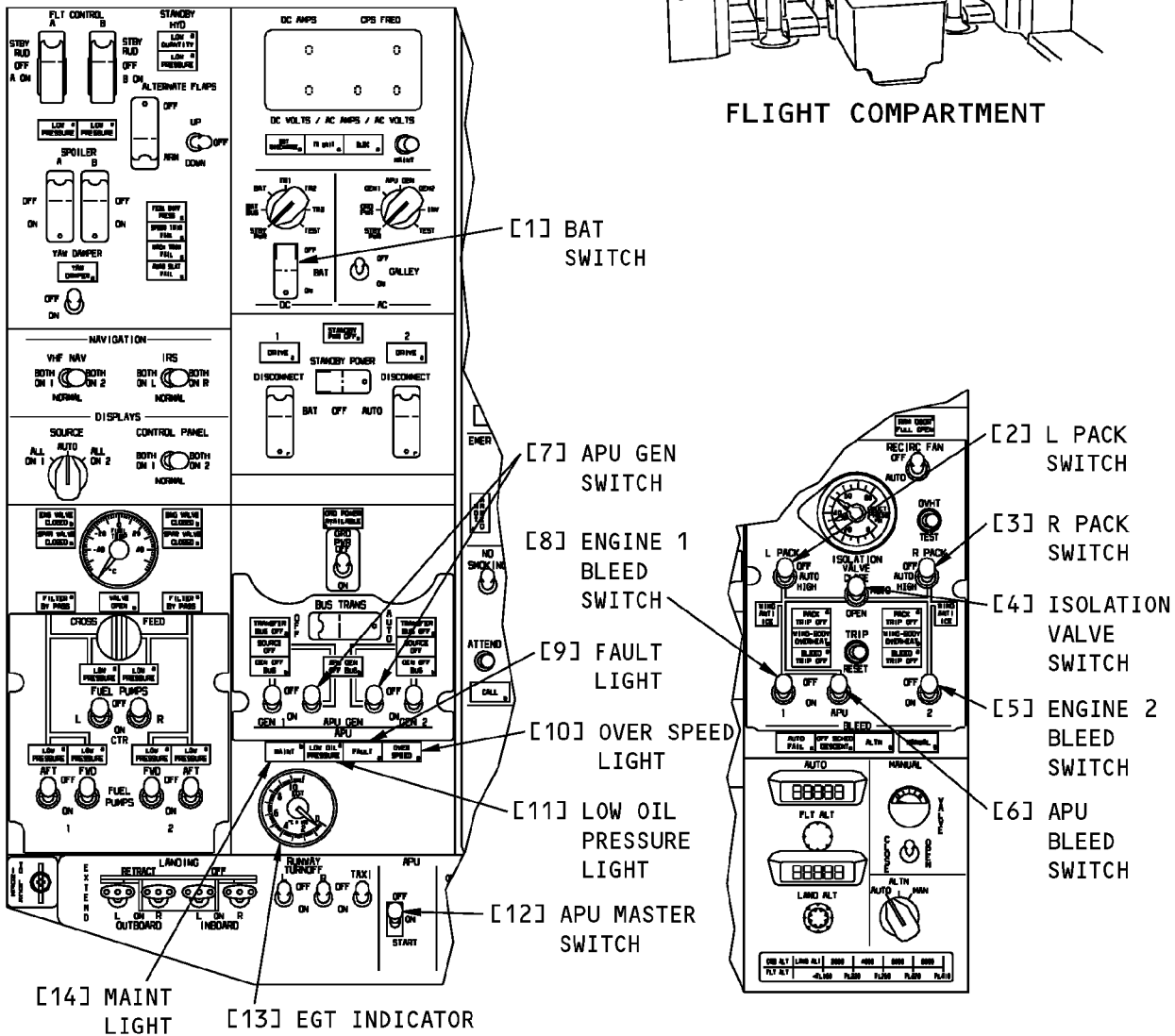
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**FLIGHT COMPARTMENT**



**FORWARD OVERHEAD PANEL, P5**



**Airborne Auxiliary Power Deactivation  
Figure 901 (Sheet 1 of 5)/49-00-00-990-801**

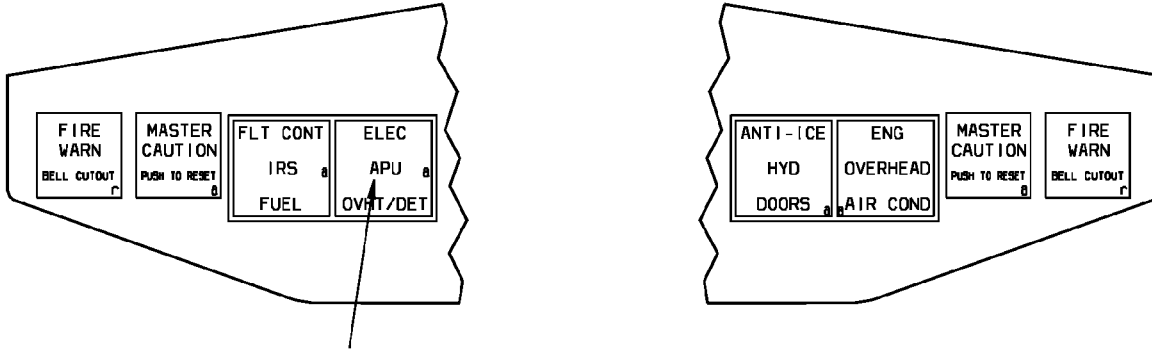
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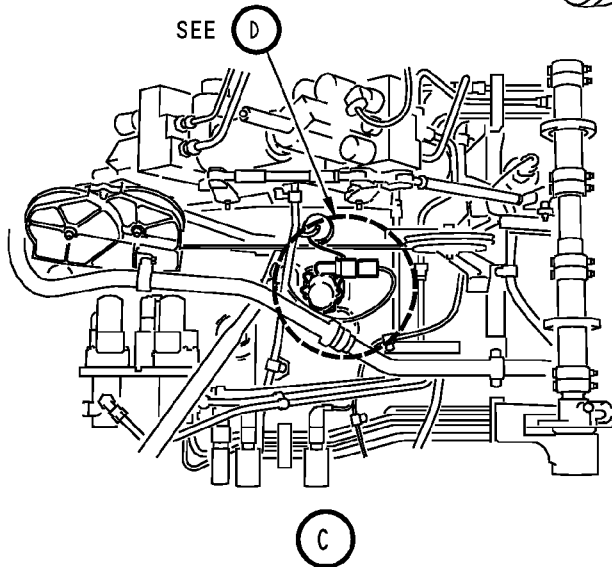
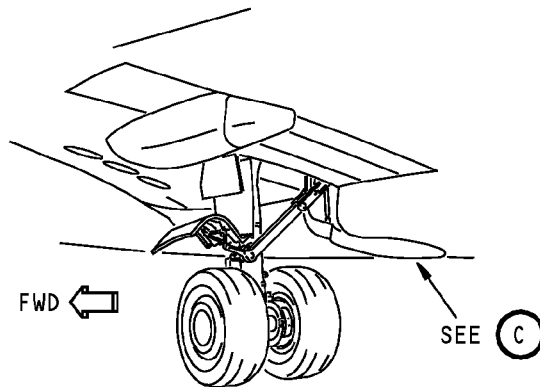
**AIRCRAFT MAINTENANCE MANUAL**



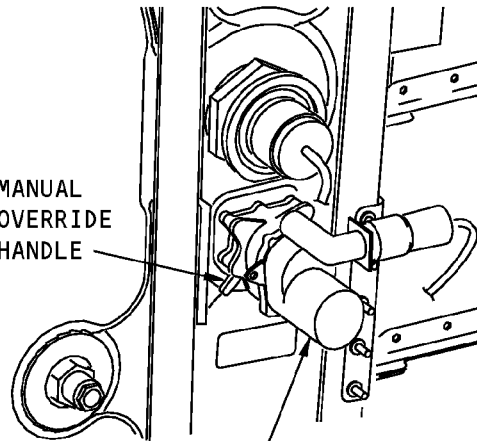
[15] APU ANNUNCIATOR LIGHT

**GLARESHIELD PANEL, P7**

(B)



[16] MANUAL  
OVERRIDE  
HANDLE



[17] APU FUEL  
SHUTOFF VALVE

**Airborne Auxiliary Power Deactivation**  
**Figure 901 (Sheet 2 of 5)/49-00-00-990-801**

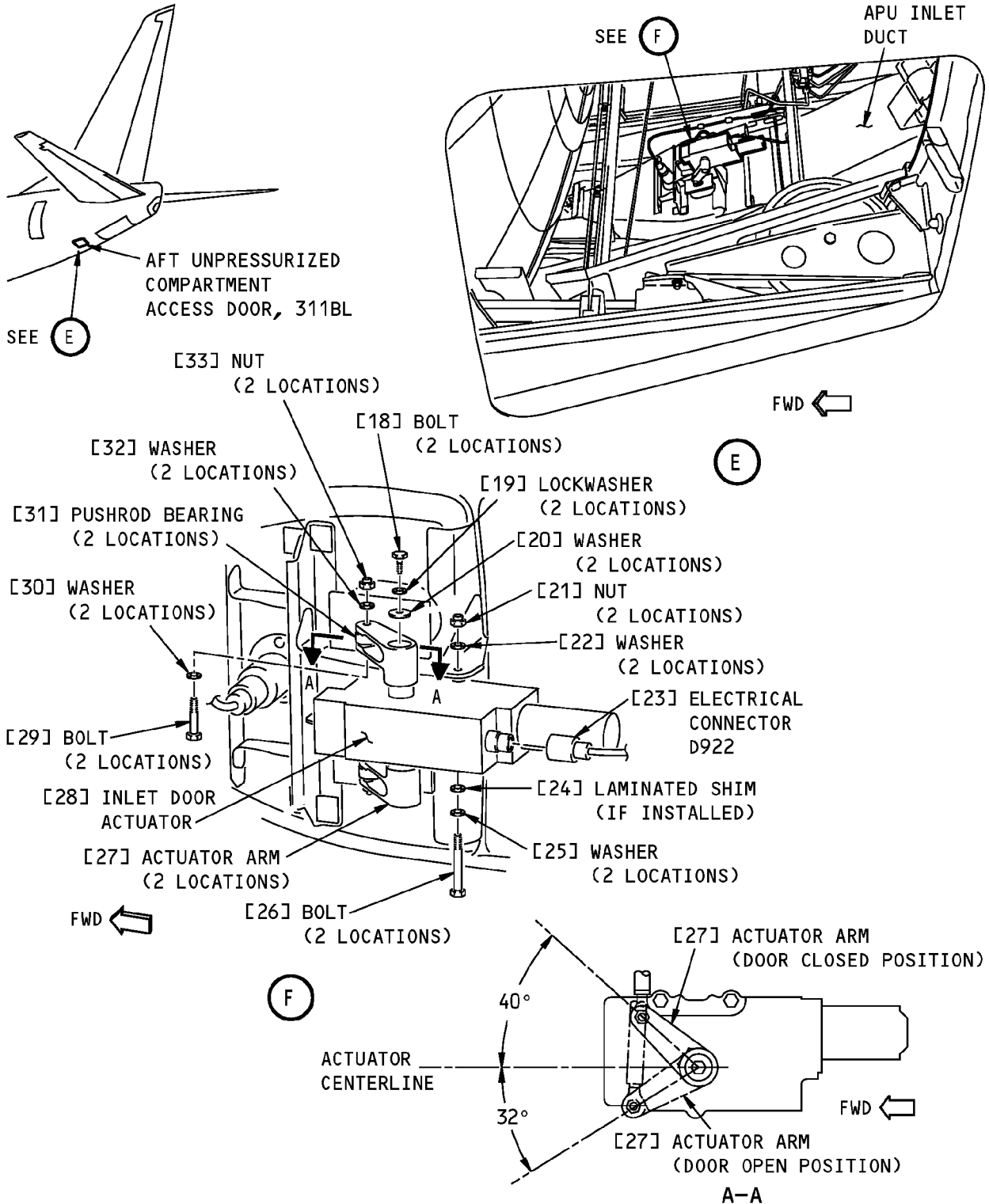
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**Airborne Auxiliary Power Deactivation  
Figure 901 (Sheet 3 of 5)/49-00-00-990-801**

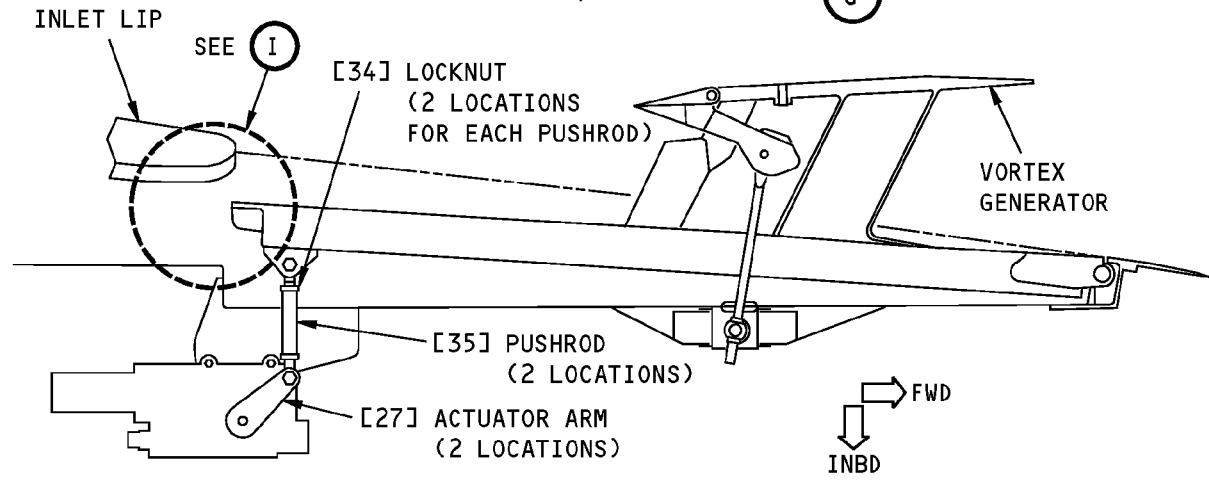
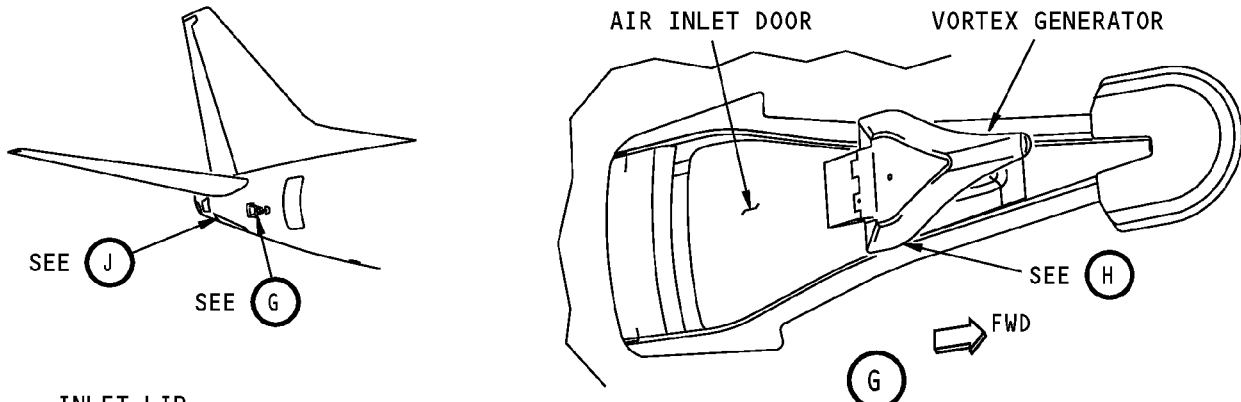
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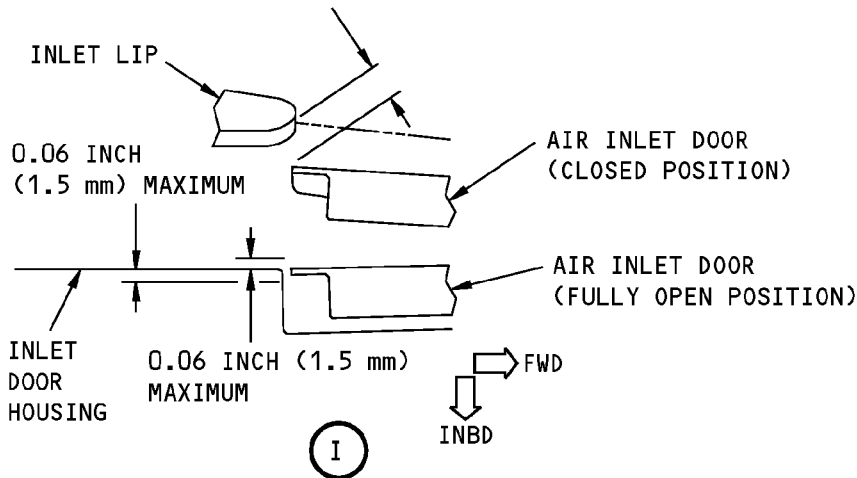
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**AIR INLET DOOR  
(CLOSED POSITION)**

1.30-1.40 INCHES (33.0-35.6 mm)  
MEASURED AT THE CENTER OF THE DOOR



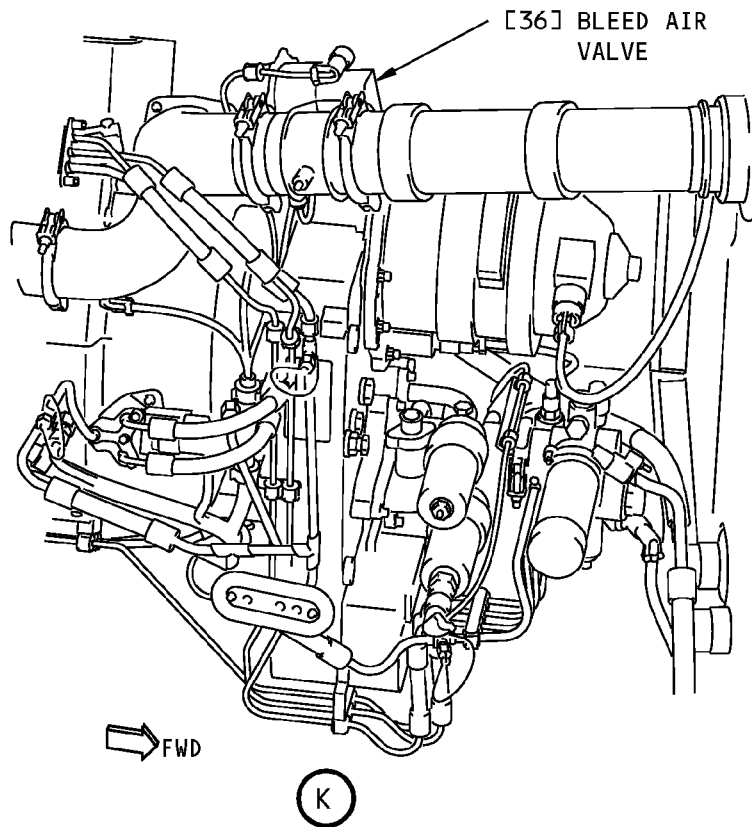
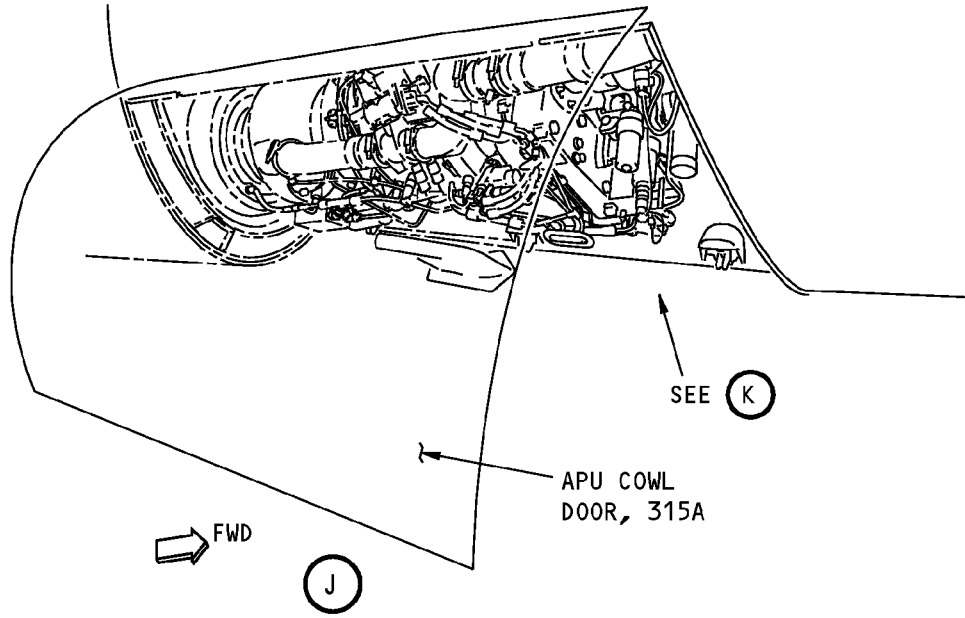
**Airborne Auxiliary Power Deactivation  
Figure 901 (Sheet 4 of 5)/49-00-00-990-801**

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**Airborne Auxiliary Power Deactivation  
Figure 901 (Sheet 5 of 5)/49-00-00-990-801**

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#### TASK 49-00-00-440-801

#### 3. M MEL 49-1 (DDPG) Restoration - APU Inoperative

(Figure 901)

##### A. General

(1) This task gives the steps to prepare the APU for operation after the deactivation procedure.

##### B. References

Reference	Title
26-15-00-710-801	APU Fire Detection - Operational Test (P/B 501)
49-11-00-710-801	APU Operational Test (P/B 501)
49-61-00-700-801	APU BITE Procedure (P/B 201)

##### C. Location Zones

Zone	Area
211	Flight Compartment - Left

##### D. Procedure

SUBTASK 49-00-00-860-004

(1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT
B	14	C01424	AUX POWER UNIT SCU FAN POWER

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
A	11	C01336	APU START CONV

SUBTASK 49-00-00-860-005

(2) Remove the APU INOP tag from the APU master switch [12] on the P5 forward overhead panel.

SUBTASK 49-00-00-710-001

(3) Do this task: APU Operational Test, TASK 49-11-00-710-801.

SUBTASK 49-00-00-740-001

(4) During the APU operational test, do this task: APU BITE Procedure, TASK 49-61-00-700-801.

(a) If maintenance message(s) show for the APU, refer to the applicable Maintenance Message Index in the FIM.

SUBTASK 49-00-00-730-001

(5) Do this task: APU Fire Detection - Operational Test, TASK 26-15-00-710-801.

————— **END OF TASK** —————

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## TASK 49-00-00-040-803

### 4. M MEL 49-4 (DDPG) Preparation - APU Annunciator MAINT Light On or Inoperative

(Figure 901)

#### A. General

- (1) This task gives the steps to prepare the airplane for flight with the APU annunciator MAINT light on or inoperative. To prepare the airplane for flight with the MAINT light inoperative, you must deactivate the MAINT light. If the MAINT light is on, you must examine the APU oil level at one time for each flight day. The MAINT light shows a low oil quantity for the APU or a problem with one of the six diodes in the APU starter-generator.

#### B. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)

#### C. Location Zones

Zone	Area
211	Flight Compartment - Left

#### D. Procedure

SUBTASK 49-00-00-860-010

- (1) If the MAINT light [14] on the P5 forward overhead panel is inoperative, install an INOP tag.

SUBTASK 49-00-00-860-011

- (2) If the MAINT light [14] is on, do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.

**NOTE:** You must examine the APU oil level at one time for each flight day. You can operate the APU after you do the oil level inspection.

**END OF TASK**

## TASK 49-00-00-440-803

### 5. M MEL 49-4 (DDPG) Restoration - APU Annunciator MAINT Light On or Inoperative

(Figure 901)

#### A. General

- (1) This task gives the steps to prepare the APU annunciator MAINT light for operation after the deactivation procedure.

#### B. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)

#### C. Location Zones

Zone	Area
211	Flight Compartment - Left

#### D. Procedure

SUBTASK 49-00-00-860-012

- (1) Remove the INOP tag from the MAINT light [14] on the P5 forward overhead panel.

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SUBTASK 49-00-00-200-001

- (2) Do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.

————— **END OF TASK** —————

**TASK 49-00-00-040-804**

**6. MMEL 49-5 (DDPG) Preparation - APU Exhaust Gas Temperature Indicator Inoperative**

(Figure 901)

A. General

- (1) This task gives the steps to prepare the airplane for flight with the APU exhaust gas temperature (EGT) indicator inoperative. To prepare the airplane for flight with the APU EGT indicator inoperative, you must deactivate the APU EGT indicator. There are no aircraft crew procedures for the use of the APU EGT indicator.

B. Location Zones

Zone	Area
211	Flight Compartment - Left

C. Procedure

SUBTASK 49-00-00-860-013

- (1) Install an INOP tag to the EGT indicator [13] on the P5 forward overhead panel.

————— **END OF TASK** —————

**TASK 49-00-00-440-804**

**7. MMEL 49-5 (DDPG) Restoration - APU Exhaust Gas Temperature Indicator Inoperative**

(Figure 901)

A. General

- (1) This task gives the steps to prepare the APU EGT indicator for operation after the deactivation procedure.

B. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left

D. Procedure

SUBTASK 49-00-00-860-014

- (1) Remove the INOP tag from the EGT indicator [13] on the P5 forward overhead panel.

SUBTASK 49-00-00-710-003

- (2) Do an operational test of the EGT indicator [13]:  
 (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

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(b) Look at the EGT indicator [13] during the APU start and operation.

NOTE: The exhaust gas temperature increases and becomes stable when the APU engine speed is 100%.

(c) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

END OF TASK

TASK 49-00-00-040-805

8. MMEL 49-6 (DDPG) Preparation - APU Air Inlet Door Inoperative

(Figure 901)

A. General

(1) This task gives the steps to prepare the airplane for flight with the air inlet door inoperative. You can manually open the air inlet door if the operation of the APU is necessary in flight or on the ground.

B. Location Zones

Table with 2 columns: Zone, Area. Rows: 211 Flight Compartment - Left, 314 Stabilizer Torsion Box Compartment - Right

C. Access Panels

Table with 2 columns: Number, Name/Location. Row: 311BL Stabilizer Trim Access Door

D. Procedure

SUBTASK 49-00-00-860-015

(1) Make sure the APU master switch [12] on the P5 forward overhead panel is OFF and install an APU INLET DOOR INOP OPEN tag.

NOTE: Use an APU INLET DOOR INOP - DO NOT USE APU tag if the air inlet door is inoperative in the closed or not fully open position.

SUBTASK 49-00-00-040-001

(2) If the operation of the APU is necessary, do these steps to put the air inlet door in the fully open position:

(a) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Table with 4 columns: Row, Col, Number, Name. Row: B, 19, C01344, APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Table with 4 columns: Row, Col, Number, Name. Row: A, 14, C00033, AUX POWER UNIT CONT

(b) Open this access panel:

Table with 2 columns: Number, Name/Location. Row: 311BL Stabilizer Trim Access Door

(c) Disconnect the electrical connector D922 [23] from the inlet door actuator [28].

(d) Install a cap chain on the electrical connector D922 [23] and the actuator receptacle.

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- (e) Remove the two nuts [33], four washers [32], [30] and two bolts [29] that attach the two pushrod bearings [31] to the two actuator arms [27].
- (f) Remove the two nuts [21], four washers [22], [25] and two bolts [26] that attach the inlet door actuator [28] to the bracket.
- (g) Remove the inlet door actuator [28] and the laminated shim(s) [24], if installed.
- (h) Remove the two bolts [18], two lockwashers [19] and two washers [20] from the two actuator arms [27].
- (i) Move the two actuator arms [27] on the actuator output shaft to the door open position.

**NOTE:** The door open position is 32 degrees inboard from the centerline of the inlet door actuator.

- (j) Install the two washers [20], two lockwashers [19] and two bolts [18].
  - 1) Tighten the two bolts [18] to 22-28 pound-inches (2.5-3.2 newton-meters).
- (k) Move the two pushrod bearings [31] approximately to the door open position of the two actuator arms [27].
- (l) Put the laminated shim(s) [24] and the inlet door actuator [28] on the bracket.
- (m) Install the inlet door actuator [28] on the bracket with the two bolts [26], four washers [25], [22] and two nuts [21].
- (n) Put the two pushrod bearings [31] in the two actuator arms [27].
- (o) Install the two bolts [29], four washers [30], [32] and two nuts [33] that attach the two pushrod bearings [31] to the two actuator arms [27].
- (p) Measure the position of the air inlet door in the fully open position.

**NOTE:** The distance from above or below the inlet door housing to the top of the air inlet door must be less than 0.06 inch (1.5 mm).

- (q) If the air inlet door is not in the limits, adjust the air inlet door:
  - 1) Remove the two nuts [33], four washers [32], [30] and two bolts [29] that attach the two pushrod bearings [31] to the two actuator arms [27].
  - 2) Loosen one of the two locknuts [34] at each end of the two pushrods [35].
  - 3) Turn the ends of the two pushrods [35] until the air inlet door aligns in the limits.

**NOTE:** The pushrod will move a distance of 0.02 inch (0.5 mm) with one half of a turn in one direction.

- 4) Tighten the two locknuts [34] on the two pushrods [35].
- 5) Put the two pushrod bearings [31] in the two actuator arms [27].
- 6) Install the two bolts [29], four washers [30], [32] and two nuts [33] that attach the two pushrod bearings [31] to the two actuator arms [27].

(r) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

(s) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-00-00-040-002

(3) If the operation of the APU is not necessary, do these steps to put the air inlet door in the closed position:

(a) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT
B	14	C01424	AUX POWER UNIT SCU FAN POWER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

(b) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

- (c) Disconnect the electrical connector D922 [23] from the inlet door actuator [28].
- (d) Install a cap chain on the electrical connector D922 [23] and the actuator receptacle.
- (e) Remove the two nuts [33], four washers [32], [30] and two bolts [29] that attach the two pushrod bearings [31] to the two actuator arms [27].
- (f) Remove the two nuts [21], four washers [22], [25] and two bolts [26] that attach the inlet door actuator [28] to the bracket.
- (g) Remove the inlet door actuator [28] and the laminated shim(s) [24], if installed.
- (h) Remove the two bolts [18], two lockwashers [19] and two washers [20] from the two actuator arms [27].
- (i) Move the two actuator arms [27] on the actuator output shaft to the door closed position.  
NOTE: The door closed position is 40 degrees outboard from the centerline of the inlet door actuator.
- (j) Install the two washers [20], two lockwashers [19] and two bolts [18].  
1) Tighten the two bolts [18] to 22-28 pound-inches (2.5-3.2 newton-meters).
- (k) Move the two pushrod bearings [31] approximately to the door open position of the two actuator arms [27].
- (l) Put the laminated shim(s) [24] and the inlet door actuator [28] on the bracket.
- (m) Install the inlet door actuator [28] on the bracket with the two bolts [26], four washers [25], [22] and two nuts [21].
- (n) Put the two pushrod bearings [31] in the two actuator arms [27].

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- (o) Install the two bolts [29], four washers [30], [32] and two nuts [33] that attach the two pushrod bearings [31] to the two actuator arms [27].
(p) Measure the position of the air inlet door in the closed position.
NOTE: The clearance between the center of the air inlet door and the inner lip must be 1.30-1.40 inches (33.0-35.6 mm).
(q) If the air inlet door is not in the limits, adjust the air inlet door:
1) Remove the two nuts [33], four washers [32], [30] and two bolts [29] that attach the two pushrod bearings [31] to the two actuator arms [27].
2) Loosen one of the two locknuts [34] at each end of the two pushrods [35].
3) Turn the ends of the two pushrods [35] until the air inlet door aligns in the limits.
NOTE: The pushrod will move a distance of 0.02 inch (0.5 mm) with one half of a turn in one direction.
4) Tighten the two locknuts [34] on the two pushrods [35].
5) Put the two pushrod bearings [31] in the two actuator arms [27].
6) Install the two bolts [29], four washers [30], [32] and two nuts [33] that attach the two pushrod bearings [31] to the two actuator arms [27].
(r) Close this access panel:

Table with 2 columns: Number, Name/Location. Row 1: 311BL, Stabilizer Trim Access Door

END OF TASK

TASK 49-00-00-440-805

9. MMEL 49-6 (DDPG) Restoration - APU Air Inlet Door Inoperative

(Figure 901)

A. General

- (1) This task gives the steps to prepare the air inlet door for operation after the deactivation procedure.

B. Location Zones

Table with 2 columns: Zone, Area. Row 1: 211, Flight Compartment - Left. Row 2: 314, Stabilizer Torsion Box Compartment - Right

C. Access Panels

Table with 2 columns: Number, Name/Location. Row 1: 311BL, Stabilizer Trim Access Door

D. Procedure

SUBTASK 49-00-00-860-016

- (1) Make sure that these circuit breakers are open:

F/O Electrical System Panel, P6-2

Table with 4 columns: Row, Col, Number, Name. Row 1: B, 19, C01344, APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-00-00-010-002

(2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

SUBTASK 49-00-00-020-001

(3) Remove the cap chain from the electrical connector D922 [23] and the actuator receptacle.

SUBTASK 49-00-00-420-001

(4) Connect the electrical connector D922 [23] to the inlet door actuator [28].

SUBTASK 49-00-00-410-001

(5) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

SUBTASK 49-00-00-860-042

(6) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-00-00-860-017

(7) If you see an APU INLET DOOR INOP - DO NOT USE APU tag on the APU master switch [12], then do these steps:

(a) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	14	C01424	AUX POWER UNIT SCU FAN POWER

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<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

(b) Remove the APU INLET DOOR INOP - DO NOT USE APU tag from the APU master switch [12].

SUBTASK 49-00-00-860-043

(8) If you see an APU INLET DOOR INOP OPEN tag on the APU master switch [12], remove the tag.

SUBTASK 49-00-00-710-004

(9) Do these steps to do an operational test of the air inlet door:

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- (a) Make sure the BAT switch [1] on the P5 forward overhead panel is ON.
(b) Set the APU master switch [12] to the ON position and to the OFF position again and again.
NOTE: The air inlet door opens or closes in approximately 30 seconds. After 30 seconds, you can set the APU master switch to the other position.
(c) Make sure the inlet door actuator [28] operates correctly.
(d) If it is not necessary to do other tasks, set the BAT switch [1] to the OFF position.
(e) Make sure the APU master switch [12] is OFF.

END OF TASK

TASK 49-00-00-040-806

10. MMEL 49-7 (DDPG) Preparation - APU Bleed Air System Inoperative

(Figure 901)

A. General

- (1) This task gives the steps to prepare the airplane for flight with the APU bleed air system inoperative. To prepare the airplane for flight with the APU bleed air system inoperative, you must deactivate the APU BLEED switch. If the bleed air valve is in the open position, you must deactivate the APU master switch.

B. Location Zones

Table with 2 columns: Zone, Area. Rows: 211 Flight Compartment - Left, 316 APU Compartment - Right

C. Access Panels

Table with 2 columns: Number, Name/Location. Row: 315A APU Cowl Door

D. Procedure

SUBTASK 49-00-00-860-019

- (1) Make sure the APU BLEED switch [6] on the P5 forward overhead panel is OFF and install an INOP tag.

SUBTASK 49-00-00-010-003

- (2) Open this access panel:

Table with 2 columns: Number, Name/Location. Row: 315A APU Cowl Door

- (a) Open the three latches.
(b) Remove the retainer pin from the rod end of the forward hold-open rod on this access panel:
(c) Remove the retainer pin from the spring clip on the aft hold-open rod.
(d) Disconnect the two hold-open rods from the two spring clips.
(e) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
(f) Install the two retainer pins in the two rod ends.

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SUBTASK 49-00-00-210-001

(3) Look at the two indications on the position switch for the bleed air valve [36].

**NOTE:** There are two indications on the position switch to show the position of the bleed air valve. You can find the OPEN and CLOSED indications on the top and bottom of the bleed air valve.

(a) If the indication on the bleed air valve [36] shows OPEN, then do these steps:

1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT
B	14	C01424	AUX POWER UNIT SCU FAN POWER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

2) Install an APU INOP tag on the APU master switch [12].

(b) If the indication on the bleed air valve [36] shows CLOSED, you can start and operate the APU as an electrical power source only.

SUBTASK 49-00-00-410-002

(4) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on this access panel:
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the three latches.

————— END OF TASK —————

**TASK 49-00-00-440-806**

## 11. M MEL 49-7 (DDPG) Restoration - APU Bleed Air System Inoperative

(Figure 901)

A. General

- (1) This task gives the steps to prepare the APU bleed air system for operation after the deactivation procedure.

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**B. References**

<u>Reference</u>	<u>Title</u>
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

**C. Location Zones**

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left

**D. Procedure**

SUBTASK 49-00-00-860-020

(1) If you see an APU INOP tag on the APU master switch [12], then do these steps:

(a) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT
B	14	C01424	AUX POWER UNIT SCU FAN POWER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

(b) Remove the APU INOP tag from the APU master switch [12] on the P5 forward overhead panel.

SUBTASK 49-00-00-860-021

(2) Remove the INOP tag from the APU BLEED switch [6] on the P5 forward overhead panel.

SUBTASK 49-00-00-710-005

(3) Do an operational test of the APU bleed air system:

(a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

(b) Set these switches on the P5 forward overhead panel:

- 1) Set the ISOLATION VALVE switch [4] to the OPEN position.
- 2) Make sure the engines 1 and/or 2 BLEED switches [8], [5] are OFF.
- 3) Make sure the L PACK switch [2] and R PACK switch [3] are OFF.
- 4) Set the APU BLEED switch [6] to the ON position.

NOTE: The bleed duct pressure must be more than 10 psig.

(c) During the APU operation, do this task: APU BITE Procedure, TASK 49-61-00-700-801.

- 1) If maintenance message(s) show for the APU bleed air system, refer to the applicable Maintenance Message Index in the FIM.

(d) Set these switches on the P5 forward overhead panel:

- 1) Set the APU BLEED switch [6] to the OFF position.

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- 2) Set the ISOLATION VALVE switch [4] to the CLOSE position.
(e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

END OF TASK

TASK 49-00-00-040-808

12. MMEL 49-15 (DDPG) Preparation - Start Power Unit Inoperative

(Figure 901)

A. General

- (1) This task gives the steps to prepare the airplane for flight with the start power unit inoperative. To prepare the airplane for flight with the start power unit inoperative, you must deactivate the APU master switch if you cannot do an ac and a dc start of the APU. If you can do an ac or a dc start of the APU, you can operate the APU in flight or on the ground. It is necessary that external power or the ac generator drive system is available to do an ac start of the APU.

B. References

Table with 2 columns: Reference, Title. Rows include 49-11-00-860-801 (APU Starting and Operation) and 49-11-00-860-802 (APU Usual Shutdown).

C. Location Zones

Table with 2 columns: Zone, Area. Row includes 211 (Flight Compartment - Left).

D. Procedure

SUBTASK 49-00-00-860-026

- (1) Do these steps to do an ac start of the APU:
(a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
(b) If the APU did not start with ac power, set the APU master switch [12] to the OFF position.
(c) If the APU starts with ac power, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

SUBTASK 49-00-00-860-027

- (2) Do these steps to do a dc start of the APU:
(a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
(b) If the APU did not start with dc power, set the APU master switch [12] to the OFF position.
(c) If the APU starts with dc power, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

SUBTASK 49-00-00-860-028

- (3) If the APU starts with ac power and did not start with dc power, install an APU DC START INOP tag on the APU master switch [12].

SUBTASK 49-00-00-860-029

- (4) If the APU starts with dc power and did not start with ac power, install an APU AC START INOP tag on the APU master switch [12].

SUBTASK 49-00-00-860-030

- (5) Do these steps if the APU did not start with ac and dc power:
(a) Install an APU INOP tag on the APU master switch [12].

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(b) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT
B	14	C01424	AUX POWER UNIT SCU FAN POWER

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
A	11	C01336	APU START CONV

- (c) Remove the lockwire from the battery connector D11798 at the start power unit.
- (d) Disconnect the battery connector D11798 from the start power unit.
- (e) Install protection covers on the battery connector D11798 and start power unit receptacle.
- (f) Stow the battery connector D11798.

END OF TASK

TASK 49-00-00-440-808

13. MMEL 49-15 (DDPG) Restoration - Start Power Unit Inoperative

(Figure 901)

A. General

- (1) This task gives the steps to prepare the start power unit for operation after the deactivation procedure.

B. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G02166	Lockwire - Nickel-Copper Alloy (Monel)(0.020 inch Diameter)	NASM20995N~C20

D. Location Zones

Zone	Area
211	Flight Compartment - Left

E. Procedure

SUBTASK 49-00-00-860-031

- (1) If you see an APU INOP tag on the APU master switch [12], then do these steps:

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**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (a) Connect the battery connector D11798 to the start power unit.
- (b) Install the lockwire, G02166 on the battery connector D11798.
- (c) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT
B	14	C01424	AUX POWER UNIT SCU FAN POWER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

- (d) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

**NOTE:** You must do an ac start of the APU to make sure the APU starts with ac power. It is necessary that external power or the ac generator drive system is available to do an ac start of the APU.

- (e) During the APU operation, do this task: APU BITE Procedure, TASK 49-61-00-700-801.
  - 1) If maintenance message(s) show for the APU electrical system, refer to the applicable Maintenance Message Index in the FIM.
- (f) If the APU starts with ac power, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
- (g) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

**NOTE:** You must do a dc start of the APU to make sure the APU starts with dc power.

- (h) During the APU operation, do this task: APU BITE Procedure, TASK 49-61-00-700-801.
  - 1) If maintenance message(s) show for the APU electrical system, refer to the applicable Maintenance Message Index in the FIM.
- (i) If the APU starts with dc power, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
- (j) Remove the APU INOP tag from the APU master switch [12].

SUBTASK 49-00-00-860-032

- (2) If you see an APU DC START INOP tag on the APU master switch [12], then you must do a dc start of the APU:

- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

**NOTE:** You must do a dc start of the APU to make sure the APU starts with dc power.

- (b) During the APU operation, do this task: APU BITE Procedure, TASK 49-61-00-700-801.
  - 1) If maintenance message(s) show for the APU electrical system, refer to the applicable Maintenance Message Index in the FIM.
- (c) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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(d) Remove the APU DC START INOP tag from the APU master switch [12].

SUBTASK 49-00-00-860-033

(3) If you see an APU AC START INOP tag on the APU master switch [12], then you must do an ac start of the APU:

(a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

NOTE: You must do an ac start of the APU to make sure the APU starts with ac power. It is necessary that external power or the ac generator drive system is available to do an ac start of the APU.

(b) During the APU operation, do this task: APU BITE Procedure, TASK 49-61-00-700-801.

1) If maintenance message(s) show for the APU electrical system, refer to the applicable Maintenance Message Index in the FIM.

(c) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

(d) Remove the APU AC START INOP tag from the APU master switch [12].

————— **END OF TASK** —————

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## APU POWER PLANT - MAINTENANCE PRACTICES

### 1. General

A. This procedure has these tasks:

- (1) APU Operation Limits
- (2) APU Starting and Operation
- (3) APU Usual Shutdown
- (4) APU Emergency Shutdown
- (5) APU Protective Shutdown
- (6) Motor the APU
- (7) APU Preservation (Less Than 45 Days)
- (8) APU Preservation (45 Days to 180 Days)
- (9) APU Preservation (More Than 180 Days)
- (10) APU Depreservation.

B. The APU preservation tasks for the APU installed in the APU compartment (on-wing) and for the APU removed from the APU compartment (off-wing) are shown in the table below. The maximum preservation time for the APU installed in the APU compartment is two years. At the end of each 180 day period, you must do the task for APU depreservation and then the task for APU preservation (45 days to 180 days) again. At the end of the two year period, you must do the task for APU preservation (more than 180 days). This task does the APU preservation procedure, removes the APU from the APU compartment, installs all the necessary protection covers, puts the APU in a storage container and monitors the storage conditions. When you remove the APU from the APU compartment for storage (off-wing) that is more than 45 days, you must do the task for APU preservation (more than 180 days).

Table 201/49-11-00-993-808 APU Preservation Tasks

STORAGE PERIOD	APU INSTALLED IN THE APU COMPARTMENT (ON-WING)	APU REMOVED FROM THE APU COMPARTMENT FOR STORAGE (OFF-WING)
Less than 45 days	Do this task: APU Preservation (Less Than 45 Days)	No applicable task. Make sure all necessary protection covers are installed.
45 days to 180 days	Do this task: APU Preservation (45 Days to 180 Days)	Do this task: APU Preservation (More Than 180 Days)
More than 180 days	Do this task: APU Preservation (45 Days to 180 Days)	Do this task: APU Preservation (More Than 180 Days)

### **TASK 49-11-00-710-802**

### 2. APU Operation Limits

A. General

- (1) The APU operation limits are used when you operate, motor or troubleshoot the APU. The APU parameter indications for the APU operation with no load, with 100-ampere electrical load and with two-pack high ECS (no electrical load) are shown in (Table 203, Table 204, Table 202). These indications can help identify and isolate a problem to the fuel system, ignition system or bleed air system if there are more than one component or system to be replaced or repaired. If there are no evidence of an APU problem, operation outside these limits should not require an APU maintenance action.

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- (2) The switch positions and command signals for the applicable APU parameters are shown in (Table 205) for a serviceable APU. Use the four tables together to make sure the APU and airplane systems operate correctly.
- (3) You can gain access to this APU engine data through the INPUT MONITORING page on the APU BITE procedure for the control display unit.
- (4) The oil consumption limit is shown in (Figure 201). You can monitor the APU oil consumption for installed APUs.

**B. References**

Reference	Title
49-61-00-700-801	APU BITE Procedure (P/B 201)

**C. Location Zones**

Zone	Area
211	Flight Compartment - Left

**D. Procedure**

SUBTASK 49-11-00-710-003

- (1) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

**NOTE:** It is necessary to do the APU BITE procedure to see the APU parameters during an APU operation or when the APU master switch is set to the ON position only. You make the selection for the INPUT MONITORING data on the MAIN MENU page for the APU BITE TEST. The INPUT MONITORING data changes continuously during an APU operation.

Table 202/49-11-00-993-809 APU Operation Limits with No Load - Indications

Outside Air Temperature °F (°C)	0 (-17)	59 (15)	103 (39)	0 (-17)	59 (15)	103 (39)
Altitude ft (m)	Sea Level	Sea Level	Sea Level	5000 (1524)	5000 (1524)	5000 (1524)
Speed (%)	99-101	99-101	99-101	99-101	99-101	99-101
EGT (°C)	329-454	374-499	418-543	329-454	374-499	418-543
IGV Position (°)	20-24	20-24	20-24	20-24	20-24	20-24
SCV Position (°)	5-20	5-20	5-20	5-20	5-20	5-20
Delta Pressure (DP) (psid)	2-13	2-13	2-13	2-12	2-12	2-12
Total Pressure (PT) (psia)	16-26	16-26	16-26	12-23	12-23	12-23
Inlet Pressure (P2) (psia)	13.9-15	13.9-15	13.9-15	11.5-12.5	11.5-12.5	11.5-12.5

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<b>Outside Air Temperature °F (°C)</b>	<b>0 (-17)</b>	<b>59 (15)</b>	<b>103 (39)</b>	<b>0 (-17)</b>	<b>59 (15)</b>	<b>103 (39)</b>
<b>Altitude ft (m)</b>	<b>Sea Level</b>	<b>Sea Level</b>	<b>Sea Level</b>	<b>5000 (1524)</b>	<b>5000 (1524)</b>	<b>5000 (1524)</b>
Inlet Temperature (T2) (°C)	-23 to -12	9-20	34-45	-23 to -12	9-20	34-45
Fuel TMC (milli-amperes)	120-153	110-148	110-148	105-137	100-133	100-133
Fuel Flow (pounds per hour)	181-240	173-231	168-230	151-210	144-202	140-202
Generator Load (kilowatt)	---	---	---	---	---	---

Table 203/49-11-00-993-810 APU Operation Limits with 100-ampere Electrical Load - Indications

<b>Outside Air Temperature °F (°C)</b>	<b>0 (-17)</b>	<b>59 (15)</b>	<b>103 (39)</b>	<b>0 (-17)</b>	<b>59 (15)</b>	<b>103 (39)</b>
<b>Altitude ft (m)</b>	<b>Sea Level</b>	<b>Sea Level</b>	<b>Sea Level</b>	<b>5000 (1524)</b>	<b>5000 (1524)</b>	<b>5000 (1524)</b>
Speed (%)	99-101	99-101	99-101	99-101	99-101	99-101
EGT (°C)	352-474	400-524	447-573	356-482	405-532	453-582
IGV Position (°)	20-24	20-24	20-24	20-24	20-24	20-24
SCV Position (°)	5-20	5-20	5-20	5-20	5-20	5-20
Delta Pressure (DP) (psid)	2-13	2-13	2-13	2-12	2-12	2-12
Total Pressure (PT) (psia)	16-26	16-26	16-26	12-23	12-23	12-23
Inlet Pressure (P2) (psia)	13.9-15	13.9-15	13.9-15	11.5-12.5	11.5-12.5	11.5-12.5
Inlet Temperature (T2) (°C)	-23 to -12	9-20	34-45	-23 to -12	9-20	34-45
Fuel TMC (milliamperes)	130-164	125-159	130-158	110-148	110-145	105-143

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<b>Outside Air Temperature °F (°C)</b>	<b>0 (-17)</b>	<b>59 (15)</b>	<b>103 (39)</b>	<b>0 (-17)</b>	<b>59 (15)</b>	<b>103 (39)</b>
<b>Altitude ft (m)</b>	<b>Sea Level</b>	<b>Sea Level</b>	<b>Sea Level</b>	<b>5000 (1524)</b>	<b>5000 (1524)</b>	<b>5000 (1524)</b>
Fuel Flow (pounds per hour)	200-260	195-252	190-250	170-231	165-225	160-220
Generator Load (kilowatt)	28-35	28-35	28-35	28-35	28-35	28-35

Table 204/49-11-00-993-811 APU Operation Limits with Two-Pack High ECS (No Electrical Load) - Indications

<b>Outside Air Temperature °F (°C)</b>	<b>0 (-17)</b>	<b>59 (15)</b>	<b>103 (39)</b>	<b>0 (-17)</b>	<b>59 (15)</b>	<b>103 (39)</b>
<b>Altitude ft (m)</b>	<b>Sea Level</b>	<b>Sea Level</b>	<b>Sea Level</b>	<b>5000 (1524)</b>	<b>5000 (1524)</b>	<b>5000 (1524)</b>
Speed (%)	99-101	99-101	99-101	99-101	99-101	99-101
EGT (°C)	365-632	418-649	520-655	380-632	435-649	519-665
IGV Position (°)	35-48	39-52	84-97	45-58	51-64	83-97
SCV Position (°)	85-95	85-95	85-95	85-95	85-95	85-95
Delta Pressure (DP) (psid)	3-9	3-9	4-11	3-9	3-9	3-10
Total Pressure (PT) (psia)	34-45	35-45	47-57	32-42	33-43	38-48
Inlet Pressure (P2) (psia)	13.9-15	13.9-15	13.9-15	11.5-12.5	11.5-12.5	11.5-12.5
Inlet Temperature (T2) (°C)	-23 to -12	9-20	34-45	-23 to -12	9-20	34-45
Fuel TMC (milliamperes)	130-256	130-224	150-200	120-222	120-193	125-172
Fuel Flow (pounds per hour)	210-435	205-375	240-330	185-370	182-315	198-275
Generator Load (kilowatt)	---	---	---	---	---	---

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Table 205/49-11-00-993-807 APU Operation Limits - Switch/Component Positions and Command Signals

<b>APU PARAMETER</b>	<b>APU MASTER SWITCH ON - NO START</b>	<b>APU OPERATION - NO BLEED AIR</b>	<b>APU OPERATION - DUCT PRESSURE MODE</b>	<b>APU OPERATION - MAIN ENGINE START MODE</b>
Start Switch	NO	YES	YES	YES
APU ON Switch	YES	YES	YES	YES
APU OFF Switch	NO	NO	NO	NO
MES Switch(es) (ENGINE START 1 and 2 Position)	OFF, 1, 2 or Both 1 and 2	OFF, 1, 2 or Both 1 and 2	OFF	1, 2 or Both 1 and 2
Air/Ground	GRD	GRD	GRD	GRD
Left Pack (Switch Position)	OFF, AUTO or HIGH	OFF, AUTO or HIGH	OFF	OFF, AUTO or HIGH
Right Pack (Switch Position)	OFF, AUTO or HIGH	OFF, AUTO or HIGH	OFF	OFF, AUTO or HIGH
Bleed Command Switch (APU Bleed Switch Position)	OFF or ON	OFF	ON	ON
Inlet Door Open	NO/YES	YES	YES	YES
Door Not Full Open	YES/NO	NO	NO	NO
Fire Cockpit	NO	NO	NO	NO
Fire Remote Handle	NO	NO	NO	NO
Fire Detection	NO	NO	NO	NO
Airplane Model	600/700/800 [900 Airplane Model Shows as 800]	600/700/800 [900 Airplane Model Shows as 800]	600/700/800 [900 Airplane Model Shows as 800]	600/700/800 [900 Airplane Model Shows as 800]
Bleed Air Valve Position	Close	Close	Open	Open
Fuel Valve Closed Position	No	No	No	No
Fuel Valve Open Position	Yes	Yes	Yes	Yes
Ready to Load (Received Signal)	No	Yes	Yes	Yes
Start Command (Received Signal)	No	No	No	No
Load Shed Command (Received Signal)	No	No	No	No
Ignition Command (Received Signal)	No	Yes	Yes	Yes

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<b>APU PARAMETER</b>	<b>APU MASTER SWITCH ON - NO START</b>	<b>APU OPERATION - NO BLEED AIR</b>	<b>APU OPERATION - DUCT PRESSURE MODE</b>	<b>APU OPERATION - MAIN ENGINE START MODE</b>
Fuel Solenoid Command (Received Signal)	No	Yes	Yes	Yes
Bleed Solenoid Command (Received Signal)	No	No	Yes	Yes
OVER SPEED Indicator Light	Off	Off	Off	Off
FAULT Indicator Light	Off	Off	Off	Off
LOW OIL PRESSURE Indicator Light	Off	Off	Off	Off
MAINT Indicator Light	Off	Off	Off	Off

————— **END OF TASK** —————

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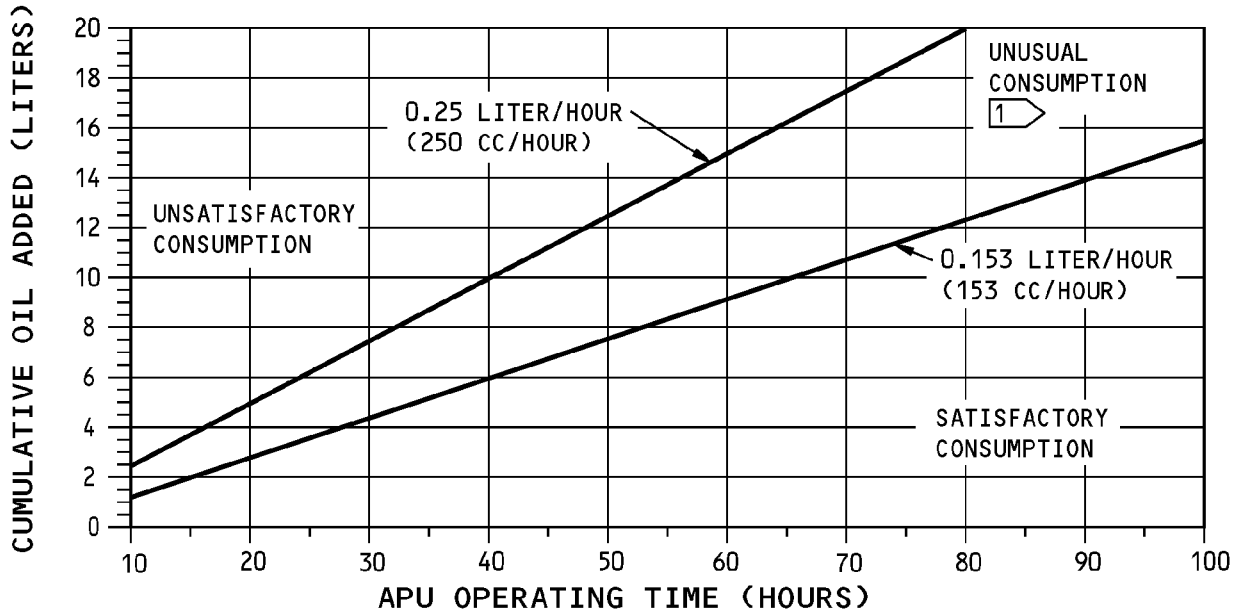
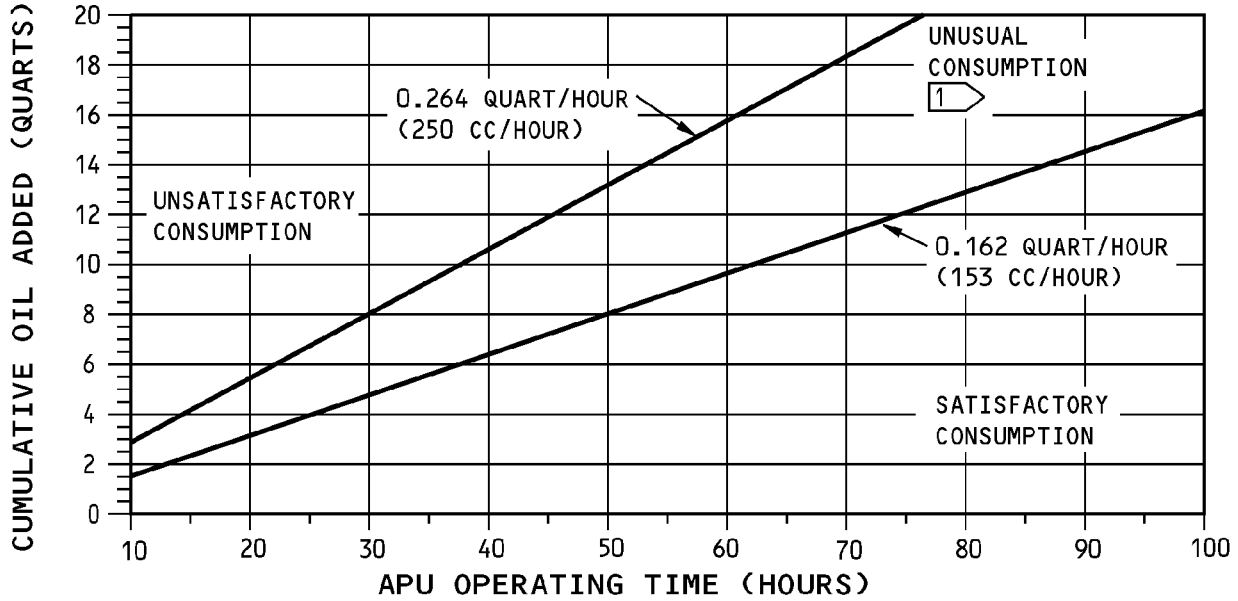
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**NOTE:** THESE GRAPHS ARE USED TO MONITOR THE APU OIL CONSUMPTION FOR INSTALLED APU'S. THE OIL CONSUMPTION FOR A NEW OR NEWLY OVERHAULED APU IS 0.008 QT/HOUR (8 CC/HOUR).

TOTAL OIL CAPACITY IN APU GEARBOX = 5.7 QUARTS (5.4 LITERS)  
 OIL QUANTITY WITH MAINT INDICATION = 3.8 QUARTS (3.6 LITERS)

**1** USE APU ONLY WHEN THE APU GEARBOX IS FILLED BEFORE EACH FLIGHT.

**Oil Consumption Limit**  
**Figure 201/49-11-00-990-804**

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TASK 49-11-00-860-801

## 3. APU Starting and Operation

(Figure 202)

### A. General

- (1) It is recommended that you do an APU starting and operation procedure at a minimum of one time in a 7 day (weekly) interval if the airplane has not operated and you did not do the APU preservation procedure during this time. You must operate the APU for a minimum of five minutes under a "no-load" condition and then do the APU shutdown procedure. In most conditions, the operation of the APU during this 7 day (weekly) interval will prevent internal/ external corrosion and damage to the fuel and oil seals/components.

### B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
12-33-01-600-802	Cold Weather Maintenance Procedure (P/B 301)

### C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
211	Flight Compartment - Left

### D. Procedure

SUBTASK 49-11-00-860-224

**WARNING:** IF A REFUELING OPERATION IS IN THE AREA, OBEY THE WARNINGS AND CAUTIONS IN THE PRESSURE REFUEL PROCEDURE BEFORE YOU DO THE APU STARTING AND OPERATION PROCEDURE. IF YOU DO NOT OBEY THE WARNINGS AND CAUTIONS, INJURY TO PERSONS CAN OCCUR.

- (1) If there is a refueling operation in the area, make sure you obey the WARNINGS and CAUTIONS in the pressure refuel procedure (Pressure Refuel Procedure, TASK 12-11-00-650-802).

SUBTASK 49-11-00-210-013

**CAUTION:** DO NOT TRY AN APU START IF THERE IS ICE AROUND THE HINGED FLAP OF THE VORTEX GENERATOR. THE MOTOR FOR THE INLET DOOR ACTUATOR CAN BE DAMAGED IF THERE IS ICE.

- (2) Make sure there is no ice around the hinged flap of the vortex generator for the air inlet door.
  - (a) If you find ice, do this task: Cold Weather Maintenance Procedure, TASK 12-33-01-600-802.

SUBTASK 49-11-00-210-014

- (3) Make sure there are no loose objects near the air inlet door.

**NOTE:** Loose objects can go into the air inlet plenum and compressor inlet plenum of the APU during the APU operation.

SUBTASK 49-11-00-860-062

- (4) Make sure the BAT switch [1] on the P5 forward overhead panel is set to the ON position.

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SUBTASK 49-11-00-210-015

**WARNING:** MAKE SURE THERE IS SUFFICIENT FUEL IN THE NO. 1 FUEL TANK TO KEEP THE BOOST PUMP INLETS COVERED DURING THE SCHEDULED APU OPERATION. DO NOT OPERATE BOOST PUMPS IN A DRY CONDITION WITH FLAMMABLE VAPORS IN THE TANK. FUEL VAPORS IN THE TANK MAY IGNITE AND CAUSE A FIRE OR EXPLOSION.

(5) Look at the fuel quantity display on the P2 center instrument panel for the No. 1 fuel tank.

**NOTE:** A minimum of 500 pounds (227 kilograms) of fuel must be in the No. 1 fuel tank.

SUBTASK 49-11-00-860-018

(6) Make sure that these circuit breakers are closed:

Battery Shield, J9

Row	Col	Number	Name
A	5	C01340	BATTERY BUS

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
A	21	C00396	FIRE PROTECTION DETECTION MASTER WARN & CONT
A	22	C00407	FIRE PROTECTION DETECTION ENG 2
A	23	C00403	FIRE PROTECTION DETECTION APU
A	24	C00405	FIRE PROTECTION DETECTION ENG 1
B	19	C01344	APU FIRE SW POWER
B	20	C00297	FIRE PROTECTION EXTINGUISHERS RIGHT
B	21	C00452	FIRE PROTECTION EXTINGUISHERS APU
B	22	C00296	FIRE PROTECTION EXTINGUISHERS LEFT
B	23	C01022	FIRE PROTECTION EXTINGUISHERS ALTN RIGHT
B	24	C01021	FIRE PROTECTION EXTINGUISHERS ALTN LEFT

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	12	C00132	MASTER CAUTION ANNUNCIATOR BUS 1
B	13	C00131	MASTER CAUTION ANNUNCIATOR BAT
C	15	C01355	LANDING GEAR AIR/GND SYS 2
C	16	C01356	LANDING GEAR AIR/GND SYS 1
D	11	C00133	INDICATOR MASTER DIM DIM/TST CONT
D	12	C00310	INDICATOR MASTER DIM BAT
D	13	C00311	INDICATOR MASTER DIM BUS 1
D	14	C00312	INDICATOR MASTER DIM BUS 2
D	15	C01401	LANDING GEAR AIR/GND RELAY
E	11	C00313	INDICATOR MASTER DIM SECT 1
E	12	C00314	INDICATOR MASTER DIM SECT 2
E	13	C00315	INDICATOR MASTER DIM SECT 3
E	14	C00316	INDICATOR MASTER DIM SECT 4
F	11	C00317	INDICATOR MASTER DIM SECT 5
F	12	C00318	INDICATOR MASTER DIM SECT 6
F	13	C01179	INDICATOR MASTER DIM SECT 7
F	14	C01180	INDICATOR MASTER DIM SECT 8

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT
B	14	C01424	AUX POWER UNIT SCU FAN POWER
D	13	C01467	AC BUS XFR BUS 2 115V AC IND
D	14	C02043	AC BUS 28V AC XFR BUS 2 SECT 2
D	15	C02047	AC BUS STBY BUS 28V AC DISTR
D	16	C00072	AC BUS STBY BUS 115V AC IND
D	18	C02029	AC BUS AC STBY BUS PWR
E	15	C00134	DC BUS INDICATION HOT BAT
E	16	C01466	DC BUS INDICATION SW HOT BAT
E	18	C00136	DC BUS INDICATION STBY
F	8	C01286	GENERATOR DISC 1
F	9	C01287	GENERATOR DISC 2
F	10	C01283	GENERATOR CONT UNIT 1
F	11	C01284	GENERATOR CONT UNIT 2
F	12	C01285	GENERATOR APU GEN CONT UNIT
F	13	C01290	GENERATOR BUS PWR CONT UNIT
F	14	C00026	DC BUS INDICATION BAT
F	16	C00023	DC BUS INDICATION BUS 1
F	18	C01338	DC BUS INDICATION BUS 2

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
<b>HAP 037-054, 101-999</b>			
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT
<b>HAP 001-013, 015-026, 028-036</b>			
D	2	C00826	FUEL BOOST PUMP TANK 1 AFT

Standby Power Control Unit, M01720

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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B	4	C00169	SW HOT BAT BUS

SUBTASK 49-11-00-860-021

(7) Make sure this circuit breaker is set correctly to do a dc or an ac start of the APU:

**NOTE:** A dc start of the APU will occur automatically if there is a problem with an ac start. This circuit breaker can be in the open or closed position.

(a) For a dc start of the APU:

1) Make sure that this circuit breaker is open:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

(b) For an ac start of the APU:

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- 1) Make sure that this circuit breaker is closed:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

SUBTASK 49-11-00-860-022

- (8) Make sure these switches on the P5 forward overhead panel are set correctly:

- (a) Set the APU master switch [16] to the OFF position.
- (b) Set the APU BLEED switch [8] to the OFF position.
- (c) Set the L PACK and R PACK switches [4], [5] to the OFF position.
- (d) Set the ISOLATION VALVE switch [6] to the CLOSE position.
- (e) Make sure the STANDBY POWER switch [10] is in the AUTO position.
- (f) Make sure the BUS TRANS switch [11] is in the AUTO position.
- (g) Momentarily set one of the two APU GEN switches [13] to the ON position and then release.

**NOTE:** It is necessary to set one of the two APU GEN switches [13] to the ON position before an APU start. This step will make sure that the ac indications on the P5-13 panel for voltage and frequency are available before you set the APU generator on line.

**WARNING:** DO NOT OPERATE ANY FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. FUEL VAPORS IN THE TANK MAY IGNITE AND CAUSE A FIRE OR EXPLOSION.

- (h) Set the No. 1 AFT FUEL PUMP switch [17] or No. 1 FWD FUEL PUMP switch [17] to the ON position.

**NOTE:** If you must use the fuel boost pumps in the No. 1 or No. 2 fuel tank and the quantity of fuel is less than 250 pounds (114 kilograms) or the center fuel tank is less than 2600 pounds (1180 kilograms), you must have a maintenance person or observer in the flight compartment to continuously monitor the LOW PRESSURE lights.

- 1) Look at the fuel quantity display on the P2 center instrument panel for the No. 1, No. 2 or center fuel tank.
- 2) Make sure there is sufficient fuel in the No. 1 or No. 2 or center fuel tank for continuous APU operation.

**NOTE:** A minimum of 500 pounds (227 kilograms) of fuel is necessary to operate the APU for one hour. If continuous APU operation is more than one hour, calculate the quantity of fuel necessary to operate the APU as follows: multiply the number of hours by 500 pounds (227 kilograms) of fuel.

- 3) If the quantity of fuel in the No. 1 or No. 2 fuel tank is more than 250 pounds (114 kilograms) or center fuel tank is more than 2600 pounds (1180 kilograms), do one of these two alternatives:
  - a) It is permitted to not have a maintenance person or observer in the flight compartment if you calculate the time that you must go back to the flight compartment when the quantity of fuel is less than these limits.
  - b) A maintenance person or observer is in the flight compartment to continuously monitor the LOW PRESSURE lights.

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- 4) If the quantity of fuel in the No. 1 or No. 2 fuel tank is less than 250 pounds (114 kilograms) or center fuel tank is less than 2600 pounds (1180 kilograms), do these steps:
  - a) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication of the fuel tank.
  - b) Immediately set the applicable fuel pump switch(es) to the OFF position if the LOW PRESSURE light comes on and stays on.
- (i) Set the AC selector switch [3] to the APU GEN position.

SUBTASK 49-11-00-710-004

(9) Do a check of the fire detection system for the APU:

- (a) Move and hold the TEST switch [21] on the P8 aft electronic panel to the OVHT/FIRE position.
  - 1) Make sure these lights come on:
    - a) The APU fire switch light (red) [19] on the P8 aft electronic panel.
    - b) The L and R MASTER CAUTION lights (amber) [27], [24] on the P7 glareshield panel.
    - c) The L and R FIRE WARN lights (red) [22], [23] on the P7 glareshield panel.
    - d) The OVHT/DET annunciator light (amber) [25] on the P7 glareshield panel.
  - 2) Make sure the fire alarm bell in the aural warning module, M315, comes on.  
NOTE: The aural warning module, M315, is in the flight compartment.
  - 3) Make sure the APU remote fire light (red) [29] in the right main wheel well flashes on and off continuously.
  - 4) Make sure the APU remote warning horn [28] in the right main wheel well comes on.
- (b) Release the TEST switch [21].
  - 1) Make sure these lights go off:
    - a) The APU fire switch light (red) [19] on the P8 aft electronic panel.
    - b) The L and R MASTER CAUTION lights (amber) [27], [24] on the P7 glareshield panel.
    - c) The L and R FIRE WARN lights (red) [22], [23] on the P7 glareshield panel.
    - d) The OVHT/DET annunciator light (amber) [25] on the P7 glareshield panel.
  - 2) Make sure the fire alarm bell in the aural warning module, M315, stops (no sound).
  - 3) Make sure the APU remote fire light (red) [29] in the right main wheel well goes off.
  - 4) Make sure the APU remote warning horn [28] in the right main wheel well stops (no sound).
- (c) Move and hold the TEST switch [21] to the FAULT/INOP position.
  - 1) Make sure these lights come on:
    - a) The FAULT light (amber) [34] on the P8 aft electronic panel.
    - b) The APU DET INOP light (amber) [18] on the P8 aft electronic panel.
    - c) The L and R MASTER CAUTION lights (amber) [27], [24] on the P7 glareshield panel.
    - d) The OVHT/DET annunciator light (amber) [25] on the P7 glareshield panel.

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- (d) Release the TEST switch [21].
  - 1) Make sure these lights go off:
    - a) The FAULT light (amber) [34] on the P8 aft electronic panel.
    - b) The APU DET INOP light (amber) [18] on the P8 aft electronic panel.
    - c) The L and R MASTER CAUTION lights (amber) [27], [24] on the P7 glareshield panel.
    - d) The OVHT/DET annunciator light (amber) [25] on the P7 glareshield panel.
- (e) Move and hold the EXT TEST switch [20] on the P8 aft electronic panel to the 1 position.
  - 1) Make sure the APU, L and R lights come on.
- (f) Move and hold the EXT TEST switch [20] to the 2 position.
  - 1) Make sure the APU, L and R lights come on.
- (g) Release the EXT TEST switch [20].
  - 1) Make sure the APU, L and R lights go off.

SUBTASK 49-11-00-280-002

**CAUTION:** AN UNDETECTED FIRE COULD OCCUR IN THE APU COMPARTMENT WITH THE APU COWL DOOR OPEN. THE APU FIRE DETECTION SYSTEM MAY NOT SENSE A SMALL FIRE AND MOST OF THE FIRE EXTINGUISHING AGENT WILL GO OUT FROM THE OPEN APU COWL DOOR. DAMAGE TO THE APU AND THE AIRPLANE CAN OCCUR.

- (10) Make sure there is an observer near the APU compartment to watch for a fire if the APU cowl door is open during the APU operation.

**NOTE:** The observer should be in voice contact with aircraft personnel to report if a fire condition occurs. Aircraft personnel can do the APU emergency shutdown procedure and other corrective actions (include the use of fire extinguishers).

SUBTASK 49-11-00-860-023

- (11) Set the APU master switch [16] to the START position and release it to the ON position.

**NOTE:** It is recommended that you obey the start duty cycle when you try to start the APU. The start duty cycle for the APU is three times in a 15 minute interval. If you do three successful or unsuccessful start cycles in a 15 minute interval, it is recommended that you wait 15 minutes after the third start cycle for the power electronics to cool. This 15 minute interval is necessary to cool the temperature of the power electronics in the start power unit and/or start converter unit. If the duty cycle is exceeded and the temperature limit is reached, the APU will not start.

SUBTASK 49-11-00-860-024

- (12) Make sure the LOW OIL PRESSURE light [15] comes on.

SUBTASK 49-11-00-860-025

- (13) Make sure the APU fuel shutoff valve opens.

**NOTE:** You can find the APU fuel shutoff valve in the rear spar of the left wing in the wheel well. The manual override handle gives an indication of the position of the shutoff valve.

SUBTASK 49-11-00-860-026

- (14) Make sure the air inlet door opens.

SUBTASK 49-11-00-860-027

- (15) Monitor these indications on the P5 forward overhead panel:

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- (a) Make sure the LOW OIL PRESSURE light [15] goes off before the APU engine speed is 95%.
- (b) Look at the CPS FREQ display [2].

NOTE: With no load applied to the APU, the CPS FREQ display must become stable at 395-405 CPS when the APU engine speed is 100%.

NOTE: The time necessary for an APU start must be less than 90 seconds.

- (c) Make sure the APU GEN OFF BUS light [12] comes on when the APU engine speed is 100%.

NOTE: When the APU GEN OFF BUS light comes on or the CPS FREQ display is stable at 395-405 CPS, the APU is prepared for pneumatic and/or electrical loads.

————— **END OF TASK** —————

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GLARESHIELD  
PANEL, P7

FORWARD  
OVERHEAD  
PANEL, P7

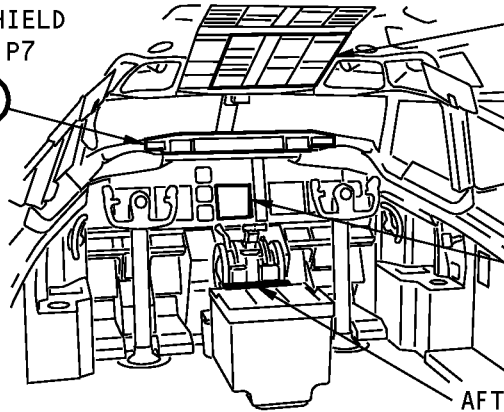
SEE (C)

SEE (A)

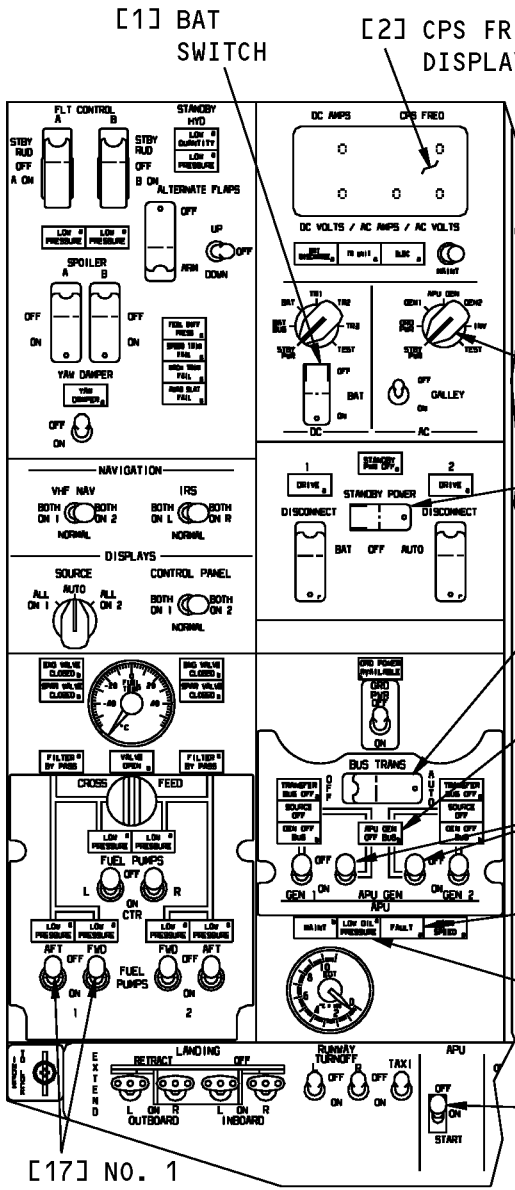
CENTER  
INSTRUMENT  
PANEL, P2

AFT ELECTRONIC  
PANEL, P8

SEE (B)



**FLIGHT COMPARTMENT**



[3] AC SELECTOR  
SWITCH

[10] STANDBY  
POWER  
SWITCH

[11] BUS TRANS  
SWITCH

[12] APU GEN  
OFF BUS  
LIGHT

[13] APU GEN  
SWITCH

[14] FAULT  
LIGHT

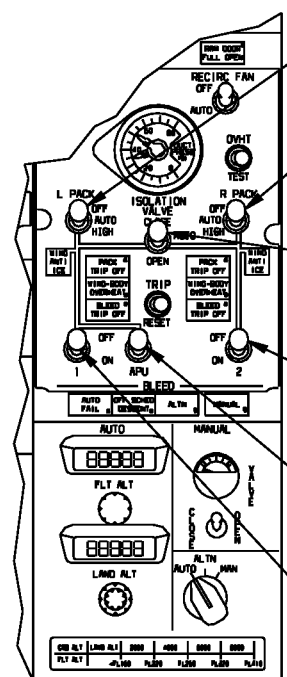
[15] LOW OIL  
PRESSURE  
LIGHT

[16] APU MASTER  
SWITCH

[17] NO. 1  
FUEL PUMP  
SWITCHES

**FORWARD OVERHEAD PANEL, P5**

(A)



[4] L PACK  
SWITCH

[5] R PACK  
SWITCH

[6] ISOLATION  
VALVE  
SWITCH

[7] ENGINE 2  
BLEED  
SWITCH

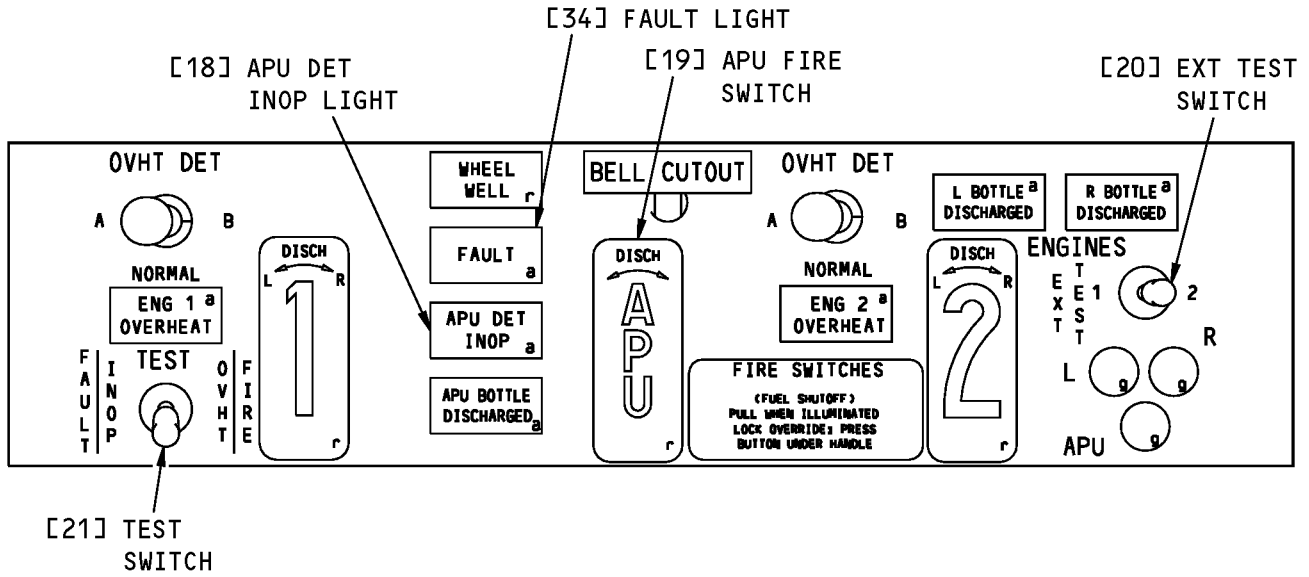
[8] APU  
BLEED  
SWITCH

[9] ENGINE 1  
BLEED  
SWITCH

**APU Start and Operation**  
Figure 202 (Sheet 1 of 5)/49-11-00-990-805

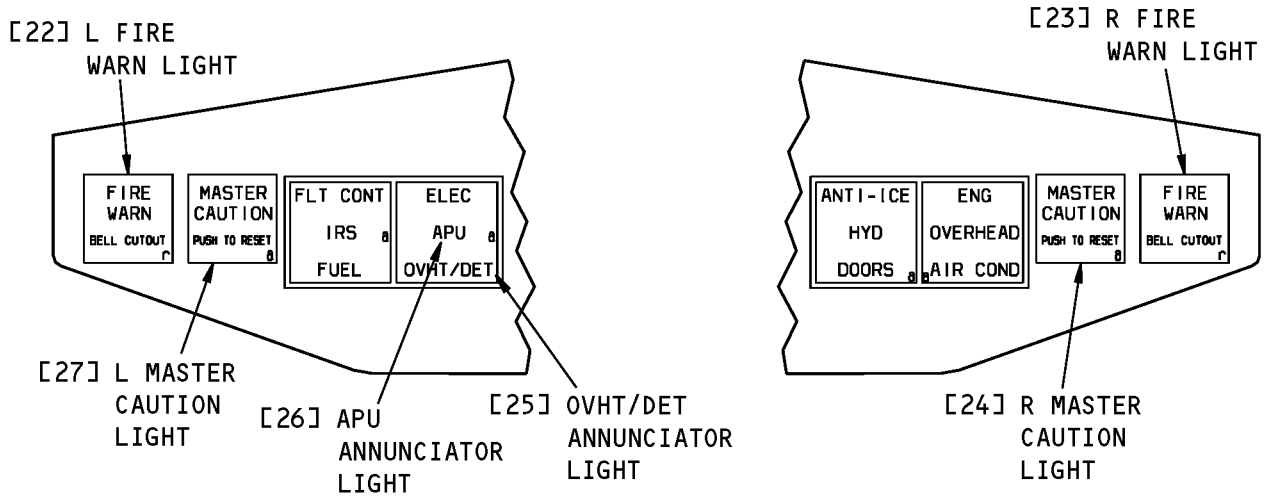
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**AFT ELECTRONIC PANEL, P8**

**(B)**



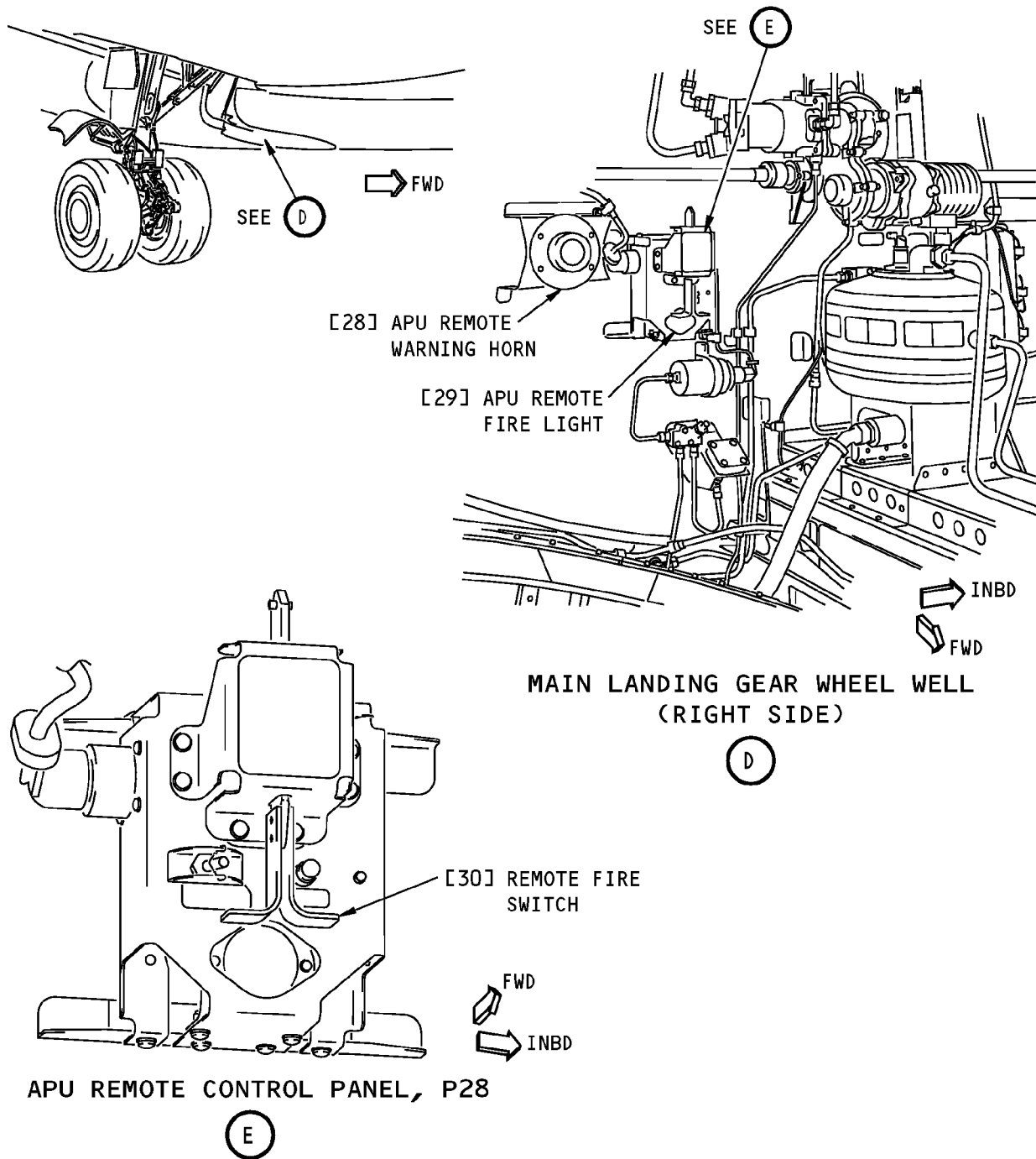
**GLARESHIELD PANEL, P7**

**(C)**

**APU Start and Operation**  
**Figure 202 (Sheet 2 of 5)/49-11-00-990-805**

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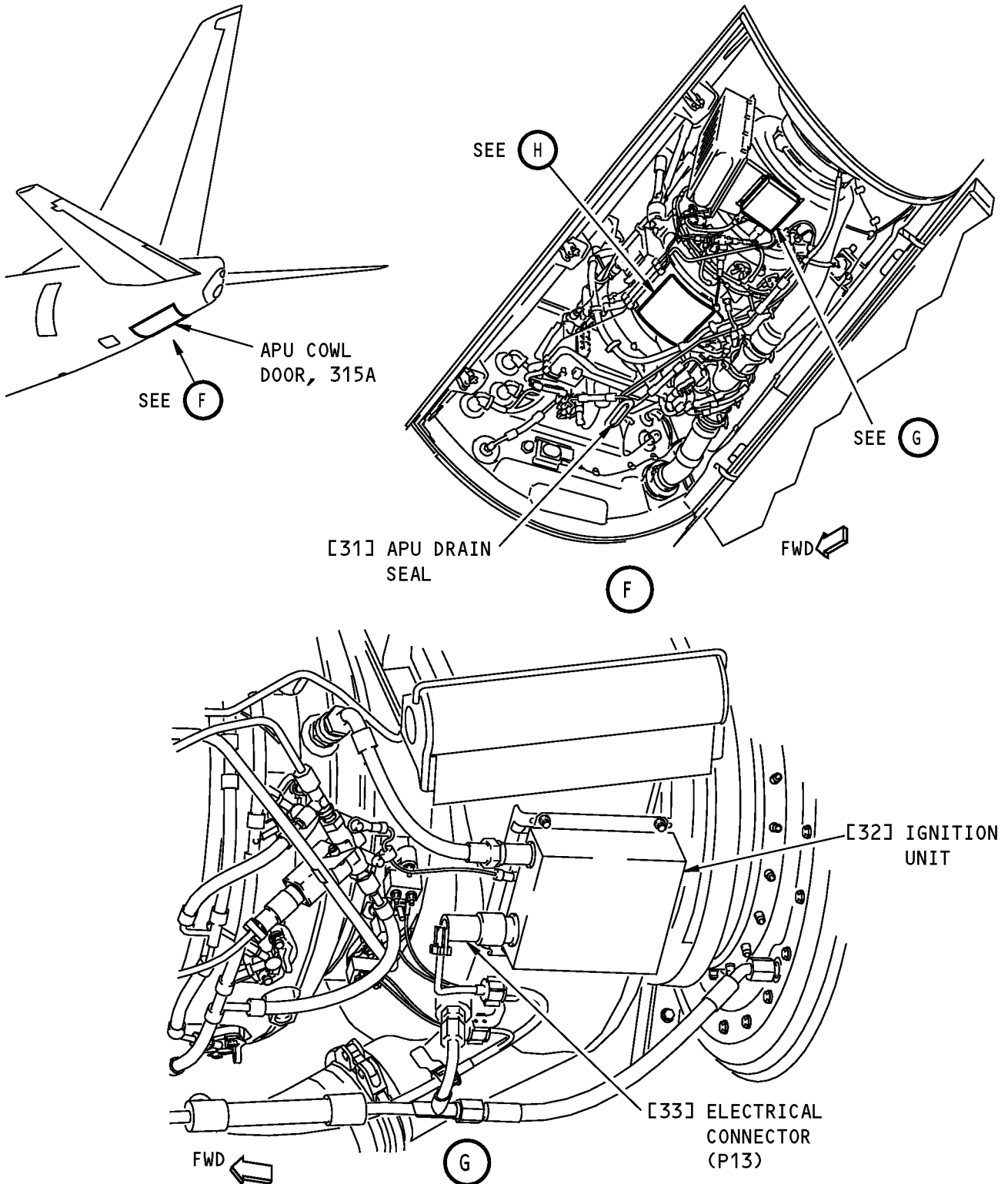


**APU Start and Operation  
Figure 202 (Sheet 3 of 5)/49-11-00-990-805**

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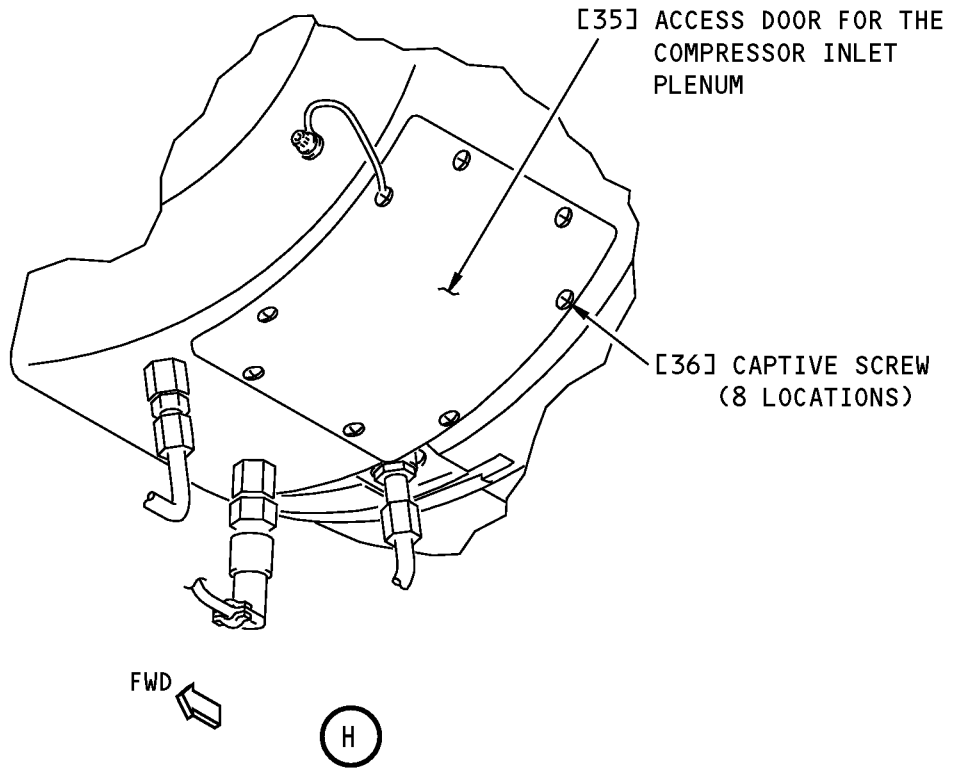
**APU Start and Operation  
Figure 202 (Sheet 4 of 5)/49-11-00-990-805**

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**APU Start and Operation**  
**Figure 202 (Sheet 5 of 5)/49-11-00-990-805**

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## TASK 49-11-00-860-802

### 4. APU Usual Shutdown

(Figure 202)

#### A. Location Zones

Zone	Area
211	Flight Compartment - Left

#### B. Procedure

SUBTASK 49-11-00-860-003

- (1) Remove all the pneumatic and/or electrical loads from the APU starter-generator.

SUBTASK 49-11-00-860-029

- (2) Make sure the BUS TRANS switch [11] is in the AUTO position.

SUBTASK 49-11-00-860-030

- (3) Set the APU master switch [16] to the OFF position.

**NOTE:** The APU continues to operate for approximately 60 seconds during its cool-down cycle. The air inlet door and the APU fuel shutoff valve must close in approximately 30 seconds.

SUBTASK 49-11-00-860-031

- (4) Set the No. 1 AFT FUEL PUMP switch [17] or No. 1 FWD FUEL PUMP switch [17] to the OFF position.

SUBTASK 49-11-00-860-075

- (5) If it is not necessary to do other tasks, set the BAT switch [1] on the P5 forward overhead panel to the OFF position.

**NOTE:** After the APU master switch is set to the OFF position, the APU continues to operate for approximately 60 seconds during its cool-down cycle. The BAT switch must not be set to the OFF position until after the APU cool-down cycle and the APU engine stops its operations.

————— END OF TASK —————

## TASK 49-11-00-860-803

### 5. APU Emergency Shutdown

(Figure 202)

#### A. References

Reference	Title
49-11-00-200-802	Inspection After an APU Power Plant Fire (P/B 601)

#### B. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

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### C. Procedure

SUBTASK 49-11-00-860-067

(1) Do these steps for the APU emergency shutdown:

**CAUTION:** WHEN YOU USE THE FIRE SWITCH TO STOP THE APU, YOU ARM THE FIRE EXTINGUISHING BOTTLE FOR THE APU. DO NOT TURN THE FIRE SWITCH BEFORE YOU MAKE SURE THERE IS A FIRE IN THE APU COMPARTMENT. WHEN YOU TURN THE FIRE SWITCH, THE FIRE EXTINGUISHING BOTTLE RELEASES ITS CONTENTS INTO THE APU COMPARTMENT.

(a) If you are in the airplane, push the manual override button and pull the APU fire switch [19] on the P8 aft electronic panel.

**NOTE:** The APU fire switch, on the P8 aft electronic panel, is also referred to as the fire handle.

(b) If you are not in the airplane, pull the remote fire switch [30] on the P28 APU remote control panel.

**NOTE:** The APU fire switch, on the P28 APU remote control panel, is also referred to as the fire handle.

(c) If there is a fire in the APU compartment, turn the fire switch [19] or [30].

**NOTE:** The fire extinguishing bottle will release its contents.

(d) Make sure the APU immediately stops its operation.

**NOTE:** The APU will do an emergency shutdown. When the APU does an emergency shutdown, it will not do the cool-down cycle.

(e) Make sure the APU FAULT light [14] on the P5 forward overhead panel comes on.

(f) Make sure the L and R MASTER CAUTION lights [27], [24] on the P7 glareshield panel come on.

(g) Make sure the APU annunciator light [26] on the P7 glareshield panel comes on.

(h) Set the APU master switch [16] to the OFF position.

(i) Set the No. 1 AFT FUEL PUMP switch [17] and No. 1 FWD FUEL PUMP switch [17] to the OFF position.

(j) Set the applicable fire switch [19] or [30] back to its initial position.

(k) Set the APU master switch [16] to the ON position.

(l) After 30 seconds, make sure the APU FAULT light [14] goes off.

(m) Make sure the APU annunciator light [26] goes off.

(n) Push and release the APU annunciator light [26].

(o) Make sure the L and R MASTER CAUTION lights [27], [24] go off.

**NOTE:** The L and R MASTER CAUTION lights stay on if the airplane finds other system faults.

(p) Set the APU master switch [16] to the OFF position.

SUBTASK 49-11-00-200-001

(2) Do the inspection after an APU power plant fire. To inspect it, do this task: Inspection After an APU Power Plant Fire, TASK 49-11-00-200-802.

————— END OF TASK —————

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**TASK 49-11-00-860-805**

**6. APU Protective Shutdown**

(Figure 202)

A. General

- (1) The APU FAULT light on the P5 forward overhead panel comes on when an APU protective shutdown has occurred.

B. Location Zones

Zone	Area
211	Flight Compartment - Left

C. Procedure

SUBTASK 49-11-00-860-032

- (1) Set the APU master switch [16] to the OFF position.

SUBTASK 49-11-00-860-033

- (2) Set the No. 1 AFT FUEL PUMP switch [17] or No. 1 FWD FUEL PUMP switch [17] to the OFF position.

SUBTASK 49-11-00-810-001

- (3) Correct the cause of the APU protective shutdown.

**END OF TASK**

**TASK 49-11-00-860-804**

**7. Motor the APU**

(Figure 202)

A. References

Reference	Title
24-22-00-860-813	Supply External Power (P/B 201)
24-22-00-860-814	Remove External Power (P/B 201)

B. Tools/Equipment

Reference	Description
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

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#### E. Procedure

SUBTASK 49-11-00-860-005

- (1) Make sure the APU master switch [16] on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-11-00-860-035

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-010-006

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

SUBTASK 49-11-00-940-001

- (4) Put the 1 gallon (4 l) fuel resistant container, STD-4049 under the APU drain seal [31].

SUBTASK 49-11-00-020-022

**WARNING:** DO NOT TOUCH THE IGNITION COMPONENTS UNTIL YOU DO THESE STEPS. THESE STEPS WILL RELEASE THE HIGH VOLTAGE FROM THE IGNITION UNIT. IF YOU DO NOT OBEY THIS PROCEDURE, INJURY TO PERSONS CAN OCCUR.

- (5) Do these steps to release the high voltage from the ignition unit [32]:
  - (a) Make sure five minutes have gone by since the last APU start.
  - (b) Disconnect the electrical connector (P13) [33] from the ignition unit [32].
  - (c) Make sure you install all necessary protection covers.

SUBTASK 49-11-00-910-001

- (6) Do this task: Supply External Power, TASK 24-22-00-860-813.

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SUBTASK 49-11-00-860-036

(7) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-860-037

(8) Remove the DO-NOT-OPERATE tag from the APU master switch.

SUBTASK 49-11-00-860-038

(9) Make sure the BAT switch [1] is ON.

SUBTASK 49-11-00-860-039

(10) Set the No. 1 AFT FUEL PUMP switch [17] or No. 1 FWD FUEL PUMP switch [17] to the ON position.

**NOTE:** If you must use the fuel boost pumps in the center tank, you must have a maintenance person or observer in the flight compartment to continuously monitor the LOW PRESSURE lights. Turn the applicable fuel boost pump to the OFF position if the LOW PRESSURE light for the center tank stays on.

SUBTASK 49-11-00-860-060

(11) Set the APU master switch [16] to the START position and release it to the ON position.

SUBTASK 49-11-00-860-061

(12) Make sure a fuel fog comes out of the exhaust duct muffler during the APU motor operation.

SUBTASK 49-11-00-860-041

(13) Motor the APU engine until the APU has a protective shutdown.

SUBTASK 49-11-00-860-042

(14) Make sure the APU FAULT light [14] comes on.

SUBTASK 49-11-00-860-043

(15) Set the APU master switch [16] to the OFF position and install a DO-NOT-OPERATE tag.

SUBTASK 49-11-00-860-044

(16) Set the No. 1 AFT FUEL PUMP switch [17] or No. 1 FWD FUEL PUMP switch [17] to the OFF position.

SUBTASK 49-11-00-860-045

(17) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-11-00-940-002

(18) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

SUBTASK 49-11-00-420-022

(19) Remove the protection covers and connect the electrical connector (P13) [33] to the ignition unit [32].

SUBTASK 49-11-00-910-002

(20) Do this task: Remove External Power, TASK 24-22-00-860-814.

SUBTASK 49-11-00-860-046

(21) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-860-047

(22) Remove the DO-NOT-OPERATE tag from the APU master switch.

SUBTASK 49-11-00-010-007

(23) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

#### TASK 49-11-00-600-801

#### 8. APU Preservation (Less Than 45 Days)

##### A. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

##### B. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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### C. Procedure

SUBTASK 49-11-00-860-048

(1) Do these steps to operate the APU:

- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (b) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

SUBTASK 49-11-00-860-049

(2) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-11-00-860-050

(3) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-210-016

(4) Make sure the air inlet door is fully closed.

SUBTASK 49-11-00-010-008

(5) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

SUBTASK 49-11-00-420-023

**WARNING:** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

(6) Install the locally-fabricated protection covers and plugs on these APU openings:

- (a) Educator housing
- (b) Oil cooler
- (c) Exhaust duct muffler.

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SUBTASK 49-11-00-860-051

(7) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-860-052

(8) Remove the DO-NOT-OPERATE tag from the APU master switch and install a preservation tag, that has the date of preservation on it.

SUBTASK 49-11-00-410-006

(9) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

SUBTASK 49-11-00-630-001

(10) At the end of the preservation period, do this task: APU Depreservation, TASK 49-11-00-600-804.

————— END OF TASK —————

## TASK 49-11-00-600-802

### 9. APU Preservation (45 Days to 180 Days)

(Figure 202)

#### A. Tools/Equipment

**NOTE:** When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

<u>Reference</u>	<u>Description</u>
COM-1537	Cart - Servicing, Engine Oil (Part #: PF53361-2PWS, Supplier: 94861, A/P Effectivity: 737-ALL) (Part #: PF53361-8PWS, Supplier: 94861, A/P Effectivity: 737-ALL) (Part #: PF53481-8PWS, Supplier: 94861, A/P Effectivity: 737-ALL) (Part #: PF55451-2WS, Supplier: 94861, A/P Effectivity: 737-ALL) (Part #: PF55451-7WS, Supplier: 94861, A/P Effectivity: 737-ALL)
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

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B. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00096	Oil - Jet Engine, Lubricating	MIL-PRF-6081, Grade 1005
D00124	Oil - Jet Engine, Lubricating	MIL-PRF-6081, Grade 1010 (NATO O-133)
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00626	Desiccant - Activated, Bagged, Packaging Use And Static Dehumidification	MIL-D-3464

C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Procedure

SUBTASK 49-11-00-860-053

- (1) Do these steps to operate the APU:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

SUBTASK 49-11-00-860-054

- (2) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-11-00-860-055

- (3) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-210-017

- (4) Make sure the air inlet door is fully closed.

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SUBTASK 49-11-00-010-009

(5) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

SUBTASK 49-11-00-020-023

**WARNING:** DO NOT TOUCH THE IGNITION COMPONENTS UNTIL YOU DO THESE STEPS. THESE STEPS WILL RELEASE THE HIGH VOLTAGE FROM THE IGNITION UNIT. IF YOU DO NOT OBEY THIS PROCEDURE, INJURY TO PERSONS CAN OCCUR.

- (6) Do these steps to release the high voltage from the ignition unit [32]:
  - (a) Make sure five minutes have gone by since the last APU start.
  - (b) Disconnect the electrical connector (P13) [33] from the ignition unit [32].
  - (c) Make sure you install all necessary protection covers.

SUBTASK 49-11-00-620-001

**WARNING:** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

- (7) Do the preservation procedure for the APU fuel system:
  - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049 below the fuel flow divider.

**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.
  - (b) Disconnect the fitting for the fuel supply tube from the fuel flow divider.
  - (c) Disconnect the fitting for the primary fuel manifold from the fuel flow divider.
  - (d) Drain the fuel from the two fittings into the 1 gallon (4 l) fuel resistant container, STD-4049.
  - (e) Connect the fitting for the fuel supply tube to the fuel flow divider.
    - 1) Tighten the fitting to 140 pound-inches (15.8 newton-meters).
  - (f) Put the 1 gallon (4 l) fuel resistant container, STD-4049 below the fuel supply tube.
  - (g) Disconnect the fuel supply tube from the fitting on the 1088 bulkhead.
  - (h) Drain the fuel from the fuel supply tube into the 1 gallon (4 l) fuel resistant container, STD-4049.

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- (i) Install a plug on the fitting at the 1088 bulkhead.
- (j) Put the 1 gallon (4 l) fuel resistant container, STD-4049 below the fitting for the primary fuel manifold.
- (k) Connect the engine oil servicing cart, COM-1537 to the fuel supply tube.

**WARNING:** DO NOT SPRAY PRESERVATION OIL IN THE COMPRESSOR INLET PLENUM. THE OIL CAN BURN AND CAUSE SMOKE AND FUMES TO GO INTO THE ENVIRONMENTAL CONTROL SYSTEM OF THE AIRPLANE DURING AN APU START.

- (l) Use the engine oil servicing cart, COM-1537 to supply the oil, D00096 or oil, D00124 to the fuel system at a light pressure (10-25 psig).

**NOTE:** It is not necessary to use a corrosion prevention oil in the lubrication system. The APU oil has satisfactory corrosion prevention.

- (m) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

- (n) Remove the DO-NOT-OPERATE tag from the APU master switch.
- (o) Make sure the BAT switch is ON.
- (p) Set the APU master switch to the START position and release it to the ON position.
- (q) Motor the APU engine until the APU has a protective shutdown and preservation oil comes out of the fitting for the primary fuel manifold.

**NOTE:** It may be necessary to motor the APU engine more than three times before the preservation oil comes out of the fitting. If you motor the APU again, it is recommended that you obey the start duty cycle. The start duty cycle for the APU is three times in a 15 minute interval. If you do three successful or unsuccessful start cycles in a 15 minute interval, it is recommended that you wait 15 minutes after the third start cycle for the power electronics to cool. This 15 minute interval is necessary to cool the temperature of the power electronics in the start power unit and/or start converter unit. If the duty cycle is exceeded and the temperature limit is reached, the APU will not start.

- (r) Drain the fuel and preservation oil from the fitting into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (s) Set the APU master switch to the OFF position and install a DO-NOT-OPERATE tag.
- (t) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

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- (u) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.
- (v) Disconnect the engine oil servicing cart, COM-1537 from the fuel supply tube.
- (w) Remove the plug from the fitting at the 1088 bulkhead.
- (x) Apply a thin layer of aircraft turbine engine oil, D50055 on the threads of the fitting at the 1088 bulkhead.
- (y) Connect the fuel supply tube to the fitting on the 1088 bulkhead.
- (z) Connect the fitting for the primary fuel manifold to the fuel flow divider.
  - 1) Tighten the fitting to 100 pound-inches (11.3 newton-meters).
- (aa) Remove the protection covers and connect the electrical connector (P13) [33] to the ignition unit [32].
- (ab) Clean the APU with alcohol, B00130 and a cotton wiper, G00034.

SUBTASK 49-11-00-620-005

- (8) Do these steps to install the two-pound dessicant bags in the exhaust duct muffler and compressor inlet plenum:
  - (a) Install a two-pound bag of desiccant, G00626 in the exhaust duct muffler.
  - (b) Loosen the eight captive screws [36] that attach the access door [35] to the compressor inlet plenum.
  - (c) Remove the access door [35] from the compressor inlet plenum.
 

NOTE: A lanyard is attached to the access door to keep the access door with the APU.
  - (d) Install a two-pound bag of desiccant, G00626 in the compressor inlet plenum.
  - (e) Install the access door [35] to the compressor inlet plenum with the eight captive screws [36].

SUBTASK 49-11-00-420-024

- (9) Install the locally-fabricated protection covers and plugs on these APU openings:
  - (a) Eductor housing
  - (b) Oil cooler
  - (c) Exhaust duct muffler.

SUBTASK 49-11-00-860-056

- (10) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-860-057

- (11) Remove the DO-NOT-OPERATE from the APU master switch and install a preservation tag, that has the date of preservation on it.

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SUBTASK 49-11-00-410-007

(12) To close the access panel, do these steps:

Table with 2 columns: Number, Name/Location. Row 1: 315A, APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
(b) Disconnect the two hold-open rods from the two brackets.
(c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A
(d) Install the retainer pin in the rod end of the forward hold-open rod.
(e) Install the retainer pin to the spring clip on the aft hold-open rod.
(f) Close the APU Cowl Door, 315A
(g) Close the three latches.

SUBTASK 49-11-00-630-002

(13) At the end of the preservation period, do this task: APU Depreservation, TASK 49-11-00-600-804.

END OF TASK

TASK 49-11-00-600-803

10. APU Preservation (More Than 180 Days)

A. General

(1) This task gives the steps to do the APU preservation for more than 180 days. You must remove the APU from the airplane.

B. References

Table with 2 columns: Reference, Title. Row 1: 49-11-00-000-801, APU Power Plant Removal (P/B 401)

C. Consumable Materials

Table with 3 columns: Reference, Description, Specification. Rows include B00130 (Alcohol - Isopropyl), G00034 (Cotton Wiper), G00253 (Material - Greaseproofed), G00626 (Desiccant)

D. Location Zones

Table with 2 columns: Zone, Area. Rows include 211 (Flight Compartment - Left), 315 (APU Compartment - Left), 316 (APU Compartment - Right)

E. Procedure

SUBTASK 49-11-00-620-002

(1) Do this task: APU Preservation (45 Days to 180 Days), TASK 49-11-00-600-802.

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SUBTASK 49-11-00-020-024

(2) Do this task: APU Power Plant Removal, TASK 49-11-00-000-801.

SUBTASK 49-11-00-420-025

(3) Install protection caps, covers and plugs on all openings and ports for the electrical, bleed air and drain systems.

**NOTE:** You can find the caps, covers and plugs for the APU in the shipping container. Use the three caps (MS90376-28) for the electrical connectors D10912 (P1), D10436 (P2) and D10434 (P3). Use the cap (MS90376-24) for the electrical connector D11118 (P4). Use the three caps (195-505-900ST1) for the bleed air valve and the two ends of the bleed air duct. Use the cover (5826053-1) for the compressor inlet section of the APU. Use the cover (194-505-9054) for the APU exhaust opening. Use the plug (NAS815-6B) on the drain tube for the exhaust duct muffler.

SUBTASK 49-11-00-550-001

(4) Do these steps to put the APU in a storage container:

- (a) Clean the external surfaces of the APU with alcohol, B00130 and a cotton wiper, G00034.
- (b) Put the APU in a material, G00253 with the one-pound bag of desiccant, G00626 at the front of the gearbox assembly.
- (c) Install a humidity indicator on the APU in a location where you can see the indicator while the APU is in storage.
- (d) Put cushions at the sharp corners to prevent damage to the barrier material.
- (e) Put the APU in a storage container.

SUBTASK 49-11-00-210-018

(5) Monitor the storage conditions:

- (a) Keep the APU in an area away from high temperatures, dust, moisture and corrosive fumes.
- (b) Examine the humidity indicator on the APU at 30-day intervals:

**NOTE:** Use the color chart instructions of the humidity indicator.

- 1) If the relative humidity is less than 40 percent, the APU is sufficiently dry until the subsequent 30 day inspection.
- 2) If the relative humidity is more than 40 percent, you must inspect the APU engine for corrosion.
  - a) If you find corrosion, send the APU to the engine shop.
  - b) If you do not find corrosion, put the APU back into the storage container with new material, G00253 and new desiccant, G00626.
- (c) At the end of the preservation period, do this task: APU Depreservation, TASK 49-11-00-600-804.

————— **END OF TASK** —————

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**TASK 49-11-00-600-804**

**11. APU Depreservation**

(Figure 202)

**A. General**

- (1) This task gives the steps to do the APU depreservation. These steps apply for all APU preservation periods.

**B. References**

Reference	Title
49-11-00-400-801	APU Power Plant Installation (P/B 401)
49-61-00-700-801	APU BITE Procedure (P/B 201)

**C. Consumable Materials**

Reference	Description	Specification
G00626	Desiccant - Activated, Bagged, Packaging Use And Static Dehumidification	MIL-D-3464

**D. Location Zones**

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

**E. Access Panels**

Number	Name/Location
315A	APU Cowl Door

**F. Procedure**

SUBTASK 49-11-00-860-058

- (1) Remove the preservation tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-11-00-860-059

- (2) Make sure the APU master switch is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-11-00-630-003

- (3) If the APU preservation was more than 180 days, then do these steps:
  - (a) Remove the APU from the storage container.
  - (b) Remove the barrier material, one-pound desiccant bag and humidity indicator from the APU.
  - (c) Remove the protection caps, covers and plugs from all openings and ports for the fuel, oil, bleed air and drain systems.
  - (d) Remove the locally-fabricated covers and plugs from these APU openings:
    - 1) Eductor housing
    - 2) Oil cooler
    - 3) Exhaust duct muffler.
  - (e) Do these steps to remove the two-pound dessicant bags from the exhaust duct muffler and compressor inlet plenum:

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- 1) Remove and discard the two-pound bag of desiccant, G00626, from the exhaust duct muffler.
- 2) Loosen the eight captive screws [36] that attach the access door [35] to the compressor inlet plenum.
- 3) Remove the access door [35] from the compressor inlet plenum.  
NOTE: A lanyard is attached to the access door to keep the access door with the APU.
- 4) Remove and discard the two-pound bag of desiccant, G00626, from the compressor inlet plenum.
- 5) Install the access door [35] to the compressor inlet plenum with the eight captive screws [36].

(f) Do this task: APU Power Plant Installation, TASK 49-11-00-400-801.

NOTE: It may be necessary to start the APU more than three times. The APU will not start until the preservation oil is out of the fuel system. It is recommended that you obey the start duty cycle when you try to start the APU. The start duty cycle for the APU is three times in a 15 minute interval. If you do three successful or unsuccessful start cycles in a 15 minute interval, it is recommended that you wait 15 minutes after the third start cycle for the power electronics to cool. This 15 minute interval is necessary to cool the temperature of the power electronics in the start power unit and/or start converter unit. If the duty cycle is exceeded and the temperature limit is reached, the APU will not start.

SUBTASK 49-11-00-630-004

(4) If the APU preservation was less than 180 days, then do these steps:

(a) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

(b) Open this access door. To open this access door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- 1) Open the three latches.
- 2) Open the APU Cowl Door, 315A.
- 3) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- 4) Remove the retainer pin from the spring clip on the aft hold-open rod.
- 5) Disconnect the two hold-open rods from the two spring clips.
- 6) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- 7) Install the two retainer pins in the two rod ends.

(c) Remove the locally-fabricated covers and plugs from these APU openings:

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- 1) Eductor housing
- 2) Oil cooler
- 3) Exhaust duct muffler.
- (d) Do these steps to remove the two-pound dessicant bags from the exhaust duct muffler and compressor inlet plenum:
  - 1) Remove and discard the two-pound bag of desiccant, G00626, from the exhaust duct muffler.
  - 2) Loosen the eight captive screws [36] that attach the access door [35] to the compressor inlet plenum.
  - 3) Remove the access door [35] from the compressor inlet plenum.

**NOTE:** A lanyard is attached to the access door to keep the access door with the APU.

  - 4) Remove and discard the two-pound bag of desiccant, G00626, from the compressor inlet plenum.
  - 5) Install the access door [35] to the compressor inlet plenum with the eight captive screws [36].

- (e) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

- (f) Close this access door. To close this access door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- 1) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- 2) Disconnect the two hold-open rods from the two brackets.
- 3) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- 4) Install the retainer pin in the rod end of the forward hold-open rod.
- 5) Install the retainer pin to the spring clip on the aft hold-open rod.
- 6) Close the APU Cowl Door, 315A.
- 7) Close the three latches.

- (g) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

**NOTE:** It may be necessary to start the APU more than three times. The APU will not start until the preservation oil is out of the fuel system. It is recommended that you obey the start duty cycle when you try to start the APU. The start duty cycle for the APU is three times in a 15 minute interval. If you do three successful or unsuccessful start cycles in a 15 minute interval, it is recommended that you wait 15 minutes after the third start cycle for the power electronics to cool. This 15 minute interval is necessary to cool the temperature of the power electronics in the start power unit and/or start converter unit. If the duty cycle is exceeded and the temperature limit is reached, the APU will not start.

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- (h) During the APU operation, do this task: APU BITE Procedure, TASK 49-61-00-700-801.
  - 1) If maintenance message(s) show for the APU, refer to the applicable Maintenance Message Index in the FIM.
- (i) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

————— **END OF TASK** —————

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### APU POWER PLANT - REMOVAL/INSTALLATION

#### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
  - (1) A removal of the auxiliary power unit (APU) power plant (fishpole hoist procedure)
  - (2) An installation of the APU (fishpole hoist procedure)
  - (3) A removal of the APU (hydraulic jack procedure)
  - (4) An installation of the APU (hydraulic jack procedure).
- C. There are two procedures available for the removal and installation of the APU. Each procedure is optional to the other. The procedure that is used is given by the ground equipment that is available.
  - (1) Fishpole Hoist Procedure:
    - (a) This procedure uses two fishpole hoists and APU hoist equipment to lift and lower the APU. The APU hoist equipment has three parts - a forward arm assembly, a center beam assembly and an aft arm assembly. The APU hoist equipment is attached to the two APU lift fittings in the APU compartment. The two fishpole hoists are attached to the APU hoist equipment and the APU. The two fishpole hoists are used to move the APU up and down in the APU compartment.
  - (2) Hydraulic Jack Procedure:
    - (a) This procedure uses a hydraulic jack assembly, an adapter and a maintenance stand to lift and lower the APU. The adapter is attached to the hydraulic jack assembly. The maintenance stand is used to lift the APU, adapter and hydraulic jack assembly to the APU compartment. The hydraulic jack assembly then moves the APU up and down in the APU compartment.

#### **TASK 49-11-00-000-801**

#### 2. APU Power Plant Removal

- A. General
  - (1) This procedure is a scheduled maintenance task.
- B. APU Power Plant Removal
  - SUBTASK 49-11-00-020-001
  - (1) Do one of these tasks to remove the APU:
    - (a) Do this task: APU Power Plant Removal (Fishpole Hoist Procedure), TASK 49-11-00-000-802.
    - (b) Do this task: APU Power Plant Removal (Hydraulic Jack Procedure), TASK 49-11-00-000-803.

————— **END OF TASK** —————

#### **TASK 49-11-00-400-801**

#### 3. APU Power Plant Installation

- A. General
  - (1) This procedure is a scheduled maintenance task.
- B. APU Power Plant Installation
  - SUBTASK 49-11-00-420-001
  - (1) Do one of these tasks to install the APU:

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- (a) Do this task: APU Power Plant Installation (Fishpole Hoist Procedure), TASK 49-11-00-400-802.
(b) Do this task: APU Power Plant Installation (Hydraulic Jack Procedure), TASK 49-11-00-400-803.

END OF TASK

TASK 49-11-00-000-802

4. APU Power Plant Removal (Fishpole Hoist Procedure)

(Figure 401)

A. General

(1) This procedure is a scheduled maintenance task.

B. References

Table with 2 columns: Reference, Title. Lists various maintenance tasks and their corresponding reference numbers and titles.

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Table with 2 columns: Reference, Description. Lists tools and equipment with their descriptions and part numbers.

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Reference	Description
SPL-1971	Protector - Thread, APU Mount Bolt (Part #: C49006-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-4157	Hoist - Fishpole, 500lb Capacity, 35 Foot Cable, 5 to 9 Foot Adjustable Telescoping Barrel (Part #: PF51-003-1, Supplier: 06714, A/P Effectivity: 737-ALL)
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

#### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### F. Prepare for the Removal

SUBTASK 49-11-00-860-006

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-11-00-860-007

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-010-001

- (3) If it is necessary to remove the APU cowl door, do this task: Auxiliary Power Unit (APU) Cowl Door Removal, TASK 52-48-21-000-801.

SUBTASK 49-11-00-010-002

- (4) If it is not necessary to remove this APU cowl door, open this APU cowl door. To open this APU cowl door, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU cowl door.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU cowl door.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.

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- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### G. Disconnect the APU Power Plant

SUBTASK 49-11-00-020-002

- (1) Do these steps to disconnect the four electrical connectors [1], [2], [3], [4] from the APU firewall receptacles on the 1088 bulkhead:
  - (a) Disconnect the electrical connector D10436 (P2) [1].
  - (b) Disconnect the electrical connector D10912 (P1) [2].
  - (c) Disconnect the electrical connector D10434 (P3) [3].
  - (d) Disconnect the electrical connector D11118 (P4) [4].
  - (e) Install the caps on the electrical connectors to prevent contamination.

SUBTASK 49-11-00-020-003

**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Do these steps to remove the fuel supply tube [5]:
  - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, under the fuel supply tube [5].
  - (b) Disconnect the fuel supply tube [5] from the fitting [6] on the 1088 bulkhead.
  - (c) Drain the fuel from the fuel supply tube [5] into the 1 gallon (4 l) fuel resistant container, STD-4049.
  - (d) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the fuel control unit.
  - (e) Loosen the nut [8] that attaches the fuel supply tube [5] to the fuel control unit.
  - (f) Turn the tube retainer on the fuel supply tube [5] counterclockwise until the flange disengages from the stud.
  - (g) Disconnect the fuel supply tube [5] from the fuel control unit.
  - (h) Drain the fuel from the fuel supply tube [5] into the 1 gallon (4 l) fuel resistant container, STD-4049.
  - (i) Remove the fuel supply tube [5].
  - (j) Remove the two packings [7] from the fuel supply tube [5].
    - 1) Discard the two packings [7].
  - (k) Install the caps or plugs on the fuel supply tube [5], fitting [6] and fuel control unit.
  - (l) Install a protection cover on the fuel supply tube [5] to prevent contamination.
  - (m) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

SUBTASK 49-11-00-020-004

- (3) Do these steps to remove the bleed air duct [11]:
  - (a) Remove the two coupling clamps [9] that hold the bleed air duct [11] to the bleed air valve and bleed duct assembly.

**NOTE:** The bleed duct assembly extends through the 1088 bulkhead.

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(b) Remove the bleed air duct [11].

**CAUTION:** BE CAREFUL WHEN YOU REMOVE THE TWO SEALS FROM THE BLEED AIR DUCT. DAMAGE TO THE SEALS CAN OCCUR.

(c) Carefully remove the two seals [10] from the bleed air duct [11].

(d) Install the protection covers on the bleed duct assembly, bleed air duct [11], two seals [10] and bleed air valve to prevent contamination.

SUBTASK 49-11-00-020-005

(4) Do these steps to disconnect the four terminal lugs [14], [16], [17], [18]:

(a) Disengage the terminal block cover [19] from the four pins on the starter-generator.

(b) Remove the terminal block cover [19].

(c) Remove the four nuts [12] from the four terminal studs.

(d) Disconnect the four terminal lugs (T1) [18], (T2) [17], (T3) [16] and (T4) [14] from the four terminal studs.

**NOTE:** The terminal strip and the fanning strip [15] show the identification of the terminal studs for each of the terminal lugs (T1), (T2), (T3) and (T4).

(e) Install the four nuts [12] on the four terminal studs.

(f) Install the terminal block cover [19] on the starter-generator:

1) Put the terminal block cover [19] on the starter-generator.

2) Engage the terminal block cover [19] to the four pins on the starter-generator.

SUBTASK 49-11-00-020-006

(5) Do these steps to disconnect the bonding jumper [20]:

(a) Remove the two nuts [21] and two washers [22] that attach the bonding jumper [20] to the APU.

(b) Disconnect the bonding jumper [20] from the two studs.

(c) Keep the two nuts [21] and two washers [22] for the replacement APU.

SUBTASK 49-11-00-020-007

(6) Do these steps to remove the drain tube [29] for the exhaust duct muffler:

(a) Disconnect the drain tube [29] from the fitting [30] on the exhaust duct muffler [23].

(b) Disconnect the drain tube [29] from the fitting [80] on the aft drain tube of the APU.

(c) Remove the drain tube [29].

(d) Install the caps or plugs on the drain tube [29], fitting [30] and fitting [80].

(e) Install a protection cover on the drain tube [29] to prevent contamination.

SUBTASK 49-11-00-020-008

(7) Do these steps to disconnect the exhaust duct muffler [23]:

(a) Remove the V-band clamp [27] from the exhaust duct muffler [23].

(b) Disconnect and move the exhaust duct muffler [23] aft about 0.25 in. (6.4 mm) from the APU.

### H. Fishpole Hoist Equipment Installation

SUBTASK 49-11-00-800-001

(1) Make sure the equipment, SPL-1968, has these parts:

(a) Forward arm assembly

(b) Aft arm assembly

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- (c) Center beam assembly.

SUBTASK 49-11-00-210-001

**CAUTION:** MAKE SURE YOU DO THE INSPECTION OF THE TWO APU LIFT FITTINGS. A DAMAGED LIFT FITTING CAN CAUSE INCORRECT SUPPORT OF THE APU. THIS CAN CAUSE DAMAGE TO THE APU.

- (2) Visually examine the two APU lift fittings [32], [34] with a flashlight to make sure there are no signs of cracks or elongations.

SUBTASK 49-11-00-480-007

- (3) Do these steps to install the center beam assembly [33] to the two APU lift fittings [32], [34]:  
(a) Remove the two lanyard pins [35] from the center beam assembly [33].

**CAUTION:** BE CAREFUL WHEN YOU MOVE THE CENTER BEAM ASSEMBLY TO THE CORRECT POSITION. YOU CAN TILT THE CENTER BEAM ASSEMBLY AS NECESSARY TO PREVENT THE CENTER BEAM ASSEMBLY FROM TOUCHING THE FIRE DETECTOR ASSEMBLY. DAMAGE TO THE FIRE DETECTOR ASSEMBLY AND WIRING CAN OCCUR.

- (b) Put the center beam assembly [33] below the two APU lift fittings [32], [34].

**NOTE:** To install the center beam assembly, make sure the directional FWD arrow points to the front of the APU.

**NOTE:** You can install the center beam assembly from the rear side or front side of the APU.

- (c) Align the holes of the center beam assembly [33] to the two APU lift fittings [32], [34].  
(d) Install the two lanyard pins [35] that attach the center beam assembly [33] to the two APU lift fittings [32], [34].

SUBTASK 49-11-00-480-008

**WARNING:** MAKE SURE THE TWO FISHPOLE HOISTS ARE IN A SERVICEABLE CONDITION. THE TWO CABLES OR CHAINS OF THE TWO FISHPOLE HOISTS MUST SHOW NO SIGNS OF DAMAGE. YOU CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

**CAUTION:** FISHPOLE HOISTS WITH A CABLE AND DRUM ASSEMBLY;

MAKE SURE THE TWO CABLES OF THE TWO FISHPOLE HOISTS ARE EQUALLY WOUND AROUND THE DRUMS BEFORE YOU USE THE TWO FISHPOLE HOISTS TO HOLD THE APU. A CABLE THAT IS NOT EQUALLY WOUND CAN CAUSE THE APU TO FALL SUDDENLY. THIS CAN CAUSE DAMAGE TO THE APU.

- (4) Do these steps to install the two hoist, COM-1462, chain fishpole hoist, COM-1592 or fishpole hoist, SPL-4157 [40] to the forward and aft arm assemblies [31], [37]:  
(a) Install the two fishpole hoists [40] to the forward and aft arm assemblies [31], [37].  
1) Make sure the two pins on the two fishpole hoists are engaged in the forward and aft arm assemblies.  
(b) Extend the two fishpole hoists [40] to a length that is easy to use.  
(c) Remove the two detent pins [39] from the forward and aft arm assemblies [31], [37].  
(d) While you unwind the two cables or chains of the two fishpole hoists, pull the cables or chains below the bottom pulley [38] and above the top pulley [38] until the two clevis fittings [44] are below the top pulley.

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- (e) Install the two detent pins [39] in the forward and aft arm assemblies [31], [37].

SUBTASK 49-11-00-480-009

- (5) Do these steps to install the forward and aft arm assemblies [31], [37] to the center beam assembly [33]:
  - (a) Remove the two lanyard pins [36] from the forward and aft arm assemblies [31], [37].
  - (b) Put the forward arm assembly [31] and fishpole hoist [40] below the center beam assembly [33].

NOTE: You can see the FWD stencil on the forward arm assembly.
  - (c) Align the holes of the center beam assembly [33] to the forward arm assembly [31].
  - (d) Install the lanyard pin [36] that attaches the forward arm assembly [31] to the center beam assembly [33].
  - (e) Put the aft arm assembly [37] and fishpole hoist [40] below the center beam assembly [33].

NOTE: You can see the AFT stencil on the aft arm assembly.
  - (f) Align the holes of the center beam assembly [33] to the aft arm assembly [37].
  - (g) Install the lanyard pin [36] that attaches the aft arm assembly [37] to the center beam assembly [33].

SUBTASK 49-11-00-480-010

- (6) Do these steps to install the two fishpole hoists [40] to the forward hoist bracket [42] and aft hoist bracket [41] on the APU:
  - (a) Make sure the two cables or chains of the two fishpole hoists are wound around the four pulleys [38].
  - (b) While you unwind the two cables or chains of the two fishpole hoists, pull the cables or chains until the two clevis fittings [44] align with the forward hoist bracket [42] and aft hoist bracket [41] on the APU.
  - (c) Install the two pins [43] that attach the two clevis fittings [44] to the forward hoist bracket [42] and aft hoist bracket [41].

NOTE: You install the pin into the aft hoist bracket and clevis fitting from the forward side of the APU.
  - (d) Wind and tighten the two cables or chains of the two fishpole hoists a sufficient amount to take the weight off of the four APU mounts.

NOTE: The weight of an APU is approximately 410 pounds (186 kg).

### I. APU Power Plant Removal

SUBTASK 49-11-00-020-009

- (1) Do these steps to disconnect the APU from the four APU mounts [48], [52], [59], [63]:
  - (a) Disconnect the left forward mount [48]:
    - 1) Remove the nut [46], two washers [50] and bolt [51] from the left forward bracket [45].
    - 2) Disconnect the left forward mount [48] from the left forward bracket [45].
    - 3) Let the left forward mount [48] hang vertically.
    - 4) Make sure the bushing [57] is installed in the left forward mount [48].
    - 5) Install the bolt [51], two washers [50] and nut [46] on the left forward mount [48].
  - (b) Disconnect the left aft mount [52], right aft mount [59], and right forward mount [63]:
    - 1) Loosen the three nuts [56], [62], [66] about four or five full turns.

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- 2) Examine the three washers [55], [61], [65] and the bottom of the left aft mount [52], right aft mount [59] and right forward mount [63] for a clearance.

**NOTE:** The clearance between the three washers and the bottom of the three mounts must be 0.20-0.25 inch (5-6 mm).

- a) If there is no clearance between the washer(s) and the bottom of the mount(s), wind and tighten the two cables or chains of the two fishpole hoists, as necessary, to get the correct clearance and to take the weight off of the three APU mounts.
- 3) Remove the nut [56] and washer [55] from the cone bolt [53] on the left aft mount [52].
- 4) Remove the nut [62] and washer [61] from the cone bolt [53] on the right aft mount [59].
- 5) Remove the nut [66] and washer [65] from the cone bolt [53] on the right forward mount [63].

**WARNING:** MAKE SURE THE THREAD PROTECTORS ARE FULLY ENGAGED ON THE CONE BOLTS. IF THE THREAD PROTECTORS ARE NOT FULLY ENGAGED, THE APU BRACKETS CAN GET CAUGHT ON THE THREAD PROTECTOR. THIS CAN CAUSE THE APU TO MOVE SUDDENLY. A SUDDEN MOVEMENT OF THE APU CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- 6) Install the protector, SPL-1971, (thread protector) [58] on the three cone bolts [53].

**NOTE:** The cone bolt is a part of the vibration isolator for the APU mount.

SUBTASK 49-11-00-020-010

- (2) Do these steps to remove the APU [71]:

**CAUTION:** BE CAREFUL WHEN YOU MOVE THE APU IN THE APU COMPARTMENT. YOU MUST TILT THE APU APPROXIMATELY 10-15° IN THE FORWARD-END-DOWN POSITION WHILE THE APU IS IN THE APU COMPARTMENT. DAMAGE TO THE FUEL SUPPLY LINE, STARTER-GENERATOR WIRE HARNESS AND ENGINE WIRE HARNESS CAN OCCUR.

- (a) Tilt the APU so that the forward end of the APU is lower than the aft end.

**NOTE:** When the APU is installed, it is in the 11° forward-end-down position.

- (b) Slowly unwind the two cables or chains of the two fishpole hoists to lower the APU out of the APU compartment.
- (c) Install the forward attach assembly [76] on the right forward bracket [64] with the washer [78] and nut [79].

**NOTE:** The assembly, SPL-1970, (cradle assembly) [69] has these three components - a forward attach assembly and two aft attach assemblies. These components attach the three APU brackets to the cradle assembly.

- (d) Install the two aft attach assemblies [77] on the left aft bracket [54] and right aft bracket [60] with the two washers [78] and two nuts [79].
- (e) Loosen the three jamnuts [72] from the three knobs [73] on the cradle assembly [69].
- (f) Loosen the three knobs [73] until the three top clamp blocks [74] disengage from the three bottom clamp blocks [75].
- (g) Open the three top clamp blocks [74].
- (h) Slowly lower the APU [71] on the cradle assembly [69] and base, SPL-1957, (transportation base) [70] until the three attach assemblies [76], [77] engage the three bottom clamp blocks [75].

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- (i) Close the three top clamp blocks [74].
- (j) Tighten the three knobs [73].
- (k) Tighten the three jamnuts [72] on the three knobs [73].
- (l) Remove the two fishpole hoists [40] from the APU:
  - 1) Remove the two pins [43] from the two clevis fittings [44].
  - 2) Wind the two cables or chains of the two fishpole hoists until the two clevis fittings [44] touch the forward and aft arm assemblies [31], [37].

SUBTASK 49-11-00-020-027

- (3) Remove the APU [71], assembly, SPL-1970, (cradle assembly) [69] and base, SPL-1957, (transportation base) [70] from the area.

SUBTASK 49-11-00-210-002

- (4) Do a general visual inspection of the APU compartment:
  - (a) Do this task: Insulation Panel Inspection, TASK 49-17-11-200-801.
  - (b) Do this task: Air Inlet Seal Inspection, TASK 49-15-11-200-801.
  - (c) Visually examine the front area and inner surfaces of the exhaust duct muffler that you can get access from the APU compartment for cracks and damage.
    - 1) If you find cracks or damage on the exhaust duct muffler, do this task: Exhaust Duct Muffler Inspection, TASK 49-81-11-200-801.
  - (d) Visually examine the inner surfaces of the seal depressor assembly [25] for damaged painted surfaces which include signs of paint peeling and missing paint.
    - 1) Signs of paint peeling and/or missing paint are permitted on the inner surfaces of the seal depressor assembly.
  - (e) Visually examine the inner surfaces of the APU air inlet plenum that you can get access to from the APU compartment for cracks and damage.
    - 1) If you find cracks or damage on the APU air inlet plenum, do this task: APU AIR INLET PLENUM - REMOVAL/INSTALLATION, PAGEBLOCK 49-15-15/401.
  - (f) Do this task: Eductor Inlet Duct Inspection, TASK 49-91-71-200-801.
  - (g) Visually examine the bleed air duct for signs of oil and other contamination.
    - 1) If you find signs of oil and other contamination, then do these tasks:
      - a) Clean the bleed air duct. To clean it, do this task: Pneumatic Duct Cleaning, TASK 36-13-01-100-801.
      - b) Remove the oil contamination from the air conditioning and pneumatic systems. To remove it, do this task: Oil Contamination Removal from Air Conditioning and Pneumatic Systems, TASK 21-00-01-100-801.

SUBTASK 49-11-00-020-011

- (5) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

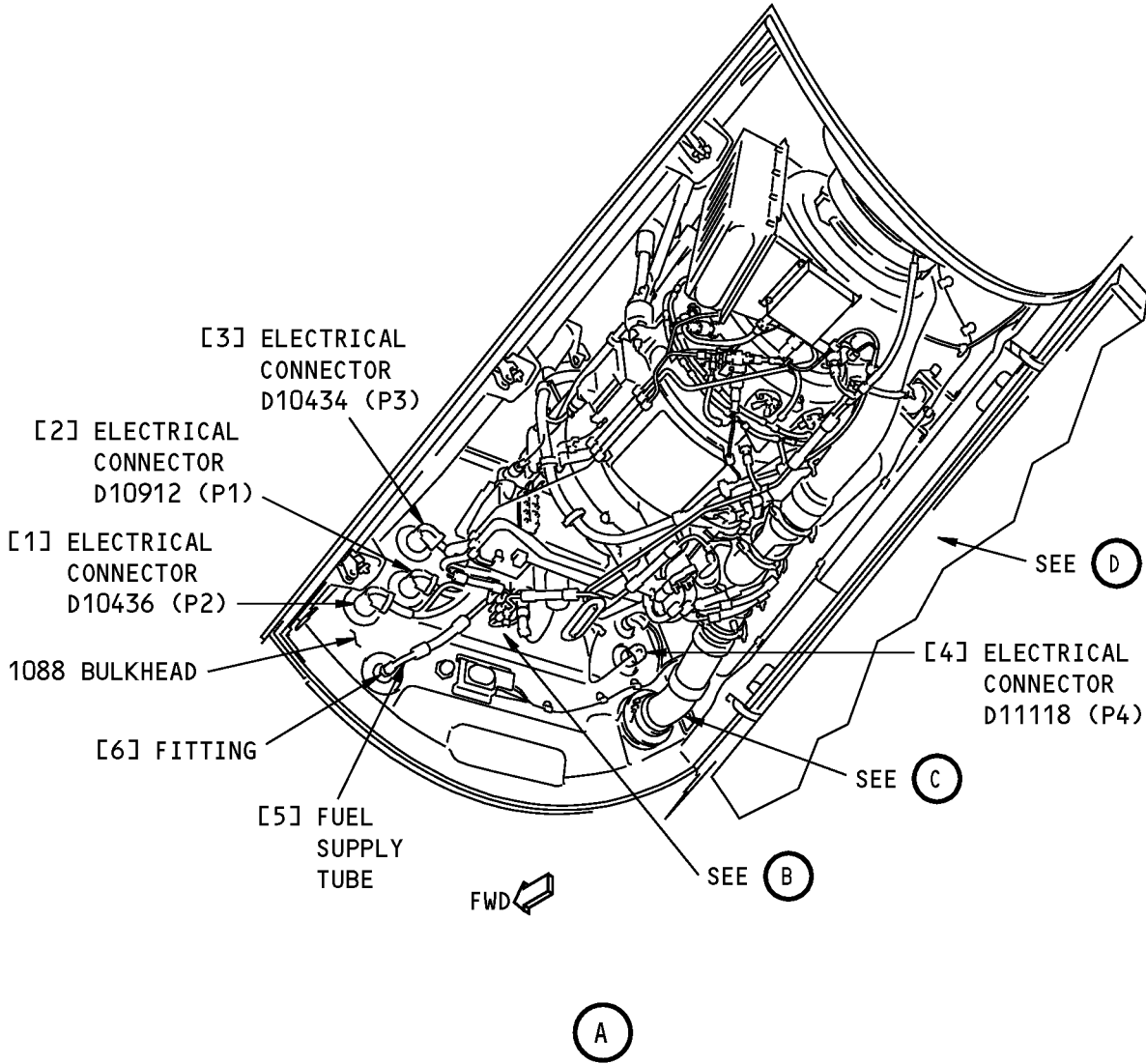
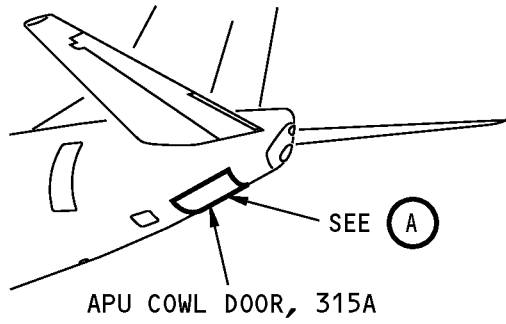
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**Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)**  
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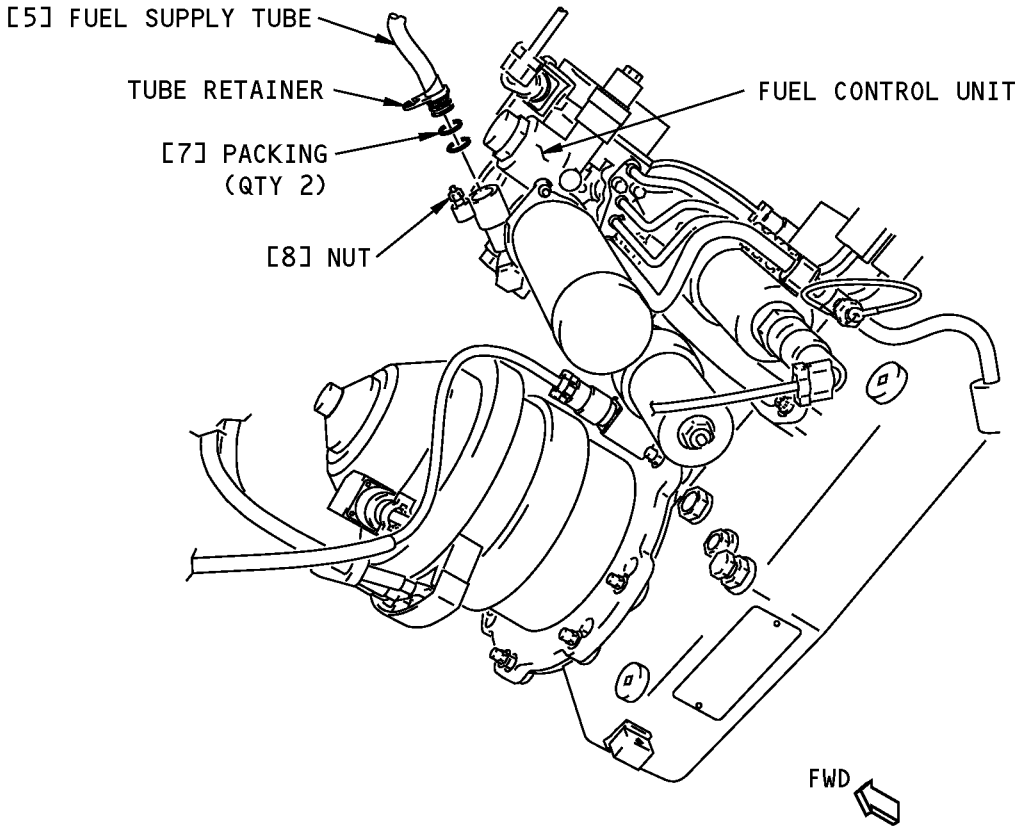
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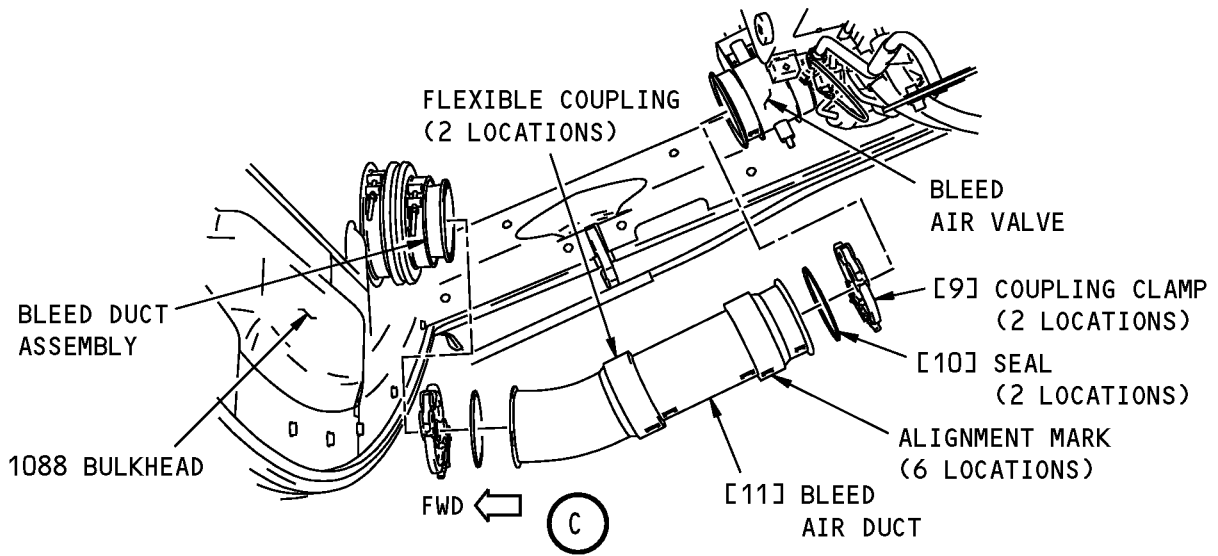
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(B)



(C)

**Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)**  
**Figure 401 (Sheet 2 of 11)/49-11-00-990-801**

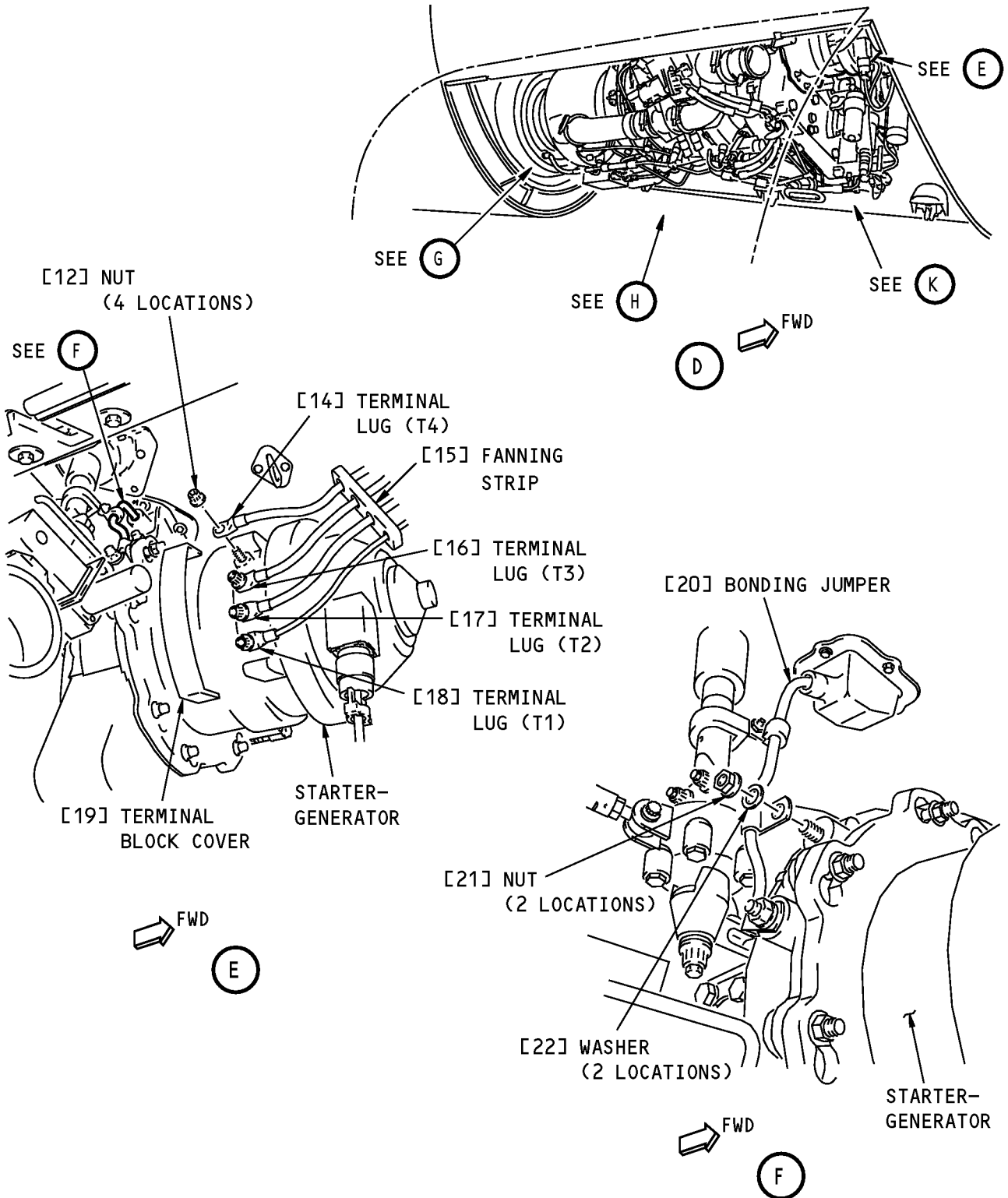
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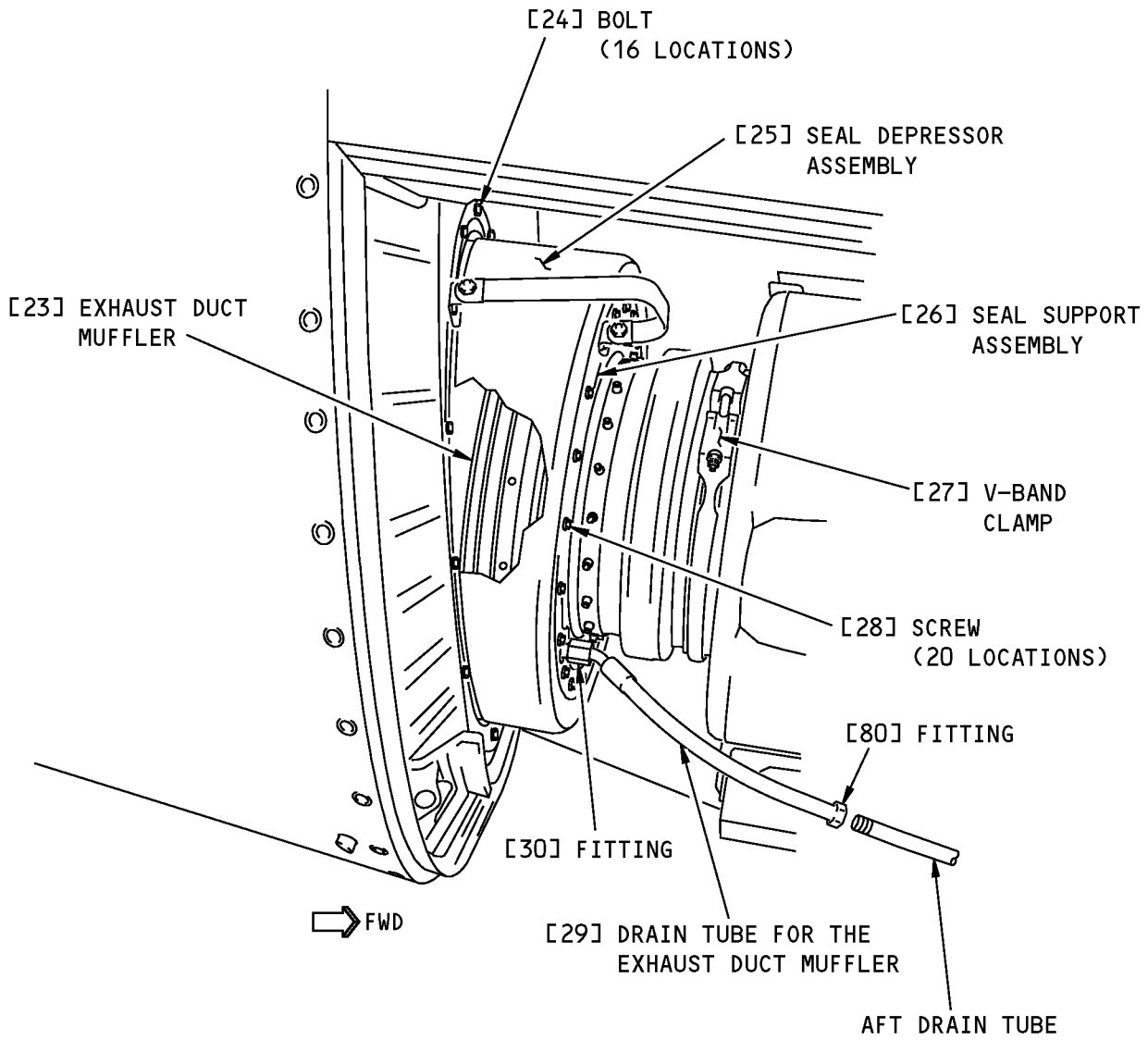
**Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)  
Figure 401 (Sheet 3 of 11)/49-11-00-990-801**

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**Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)  
Figure 401 (Sheet 4 of 11)/49-11-00-990-801**

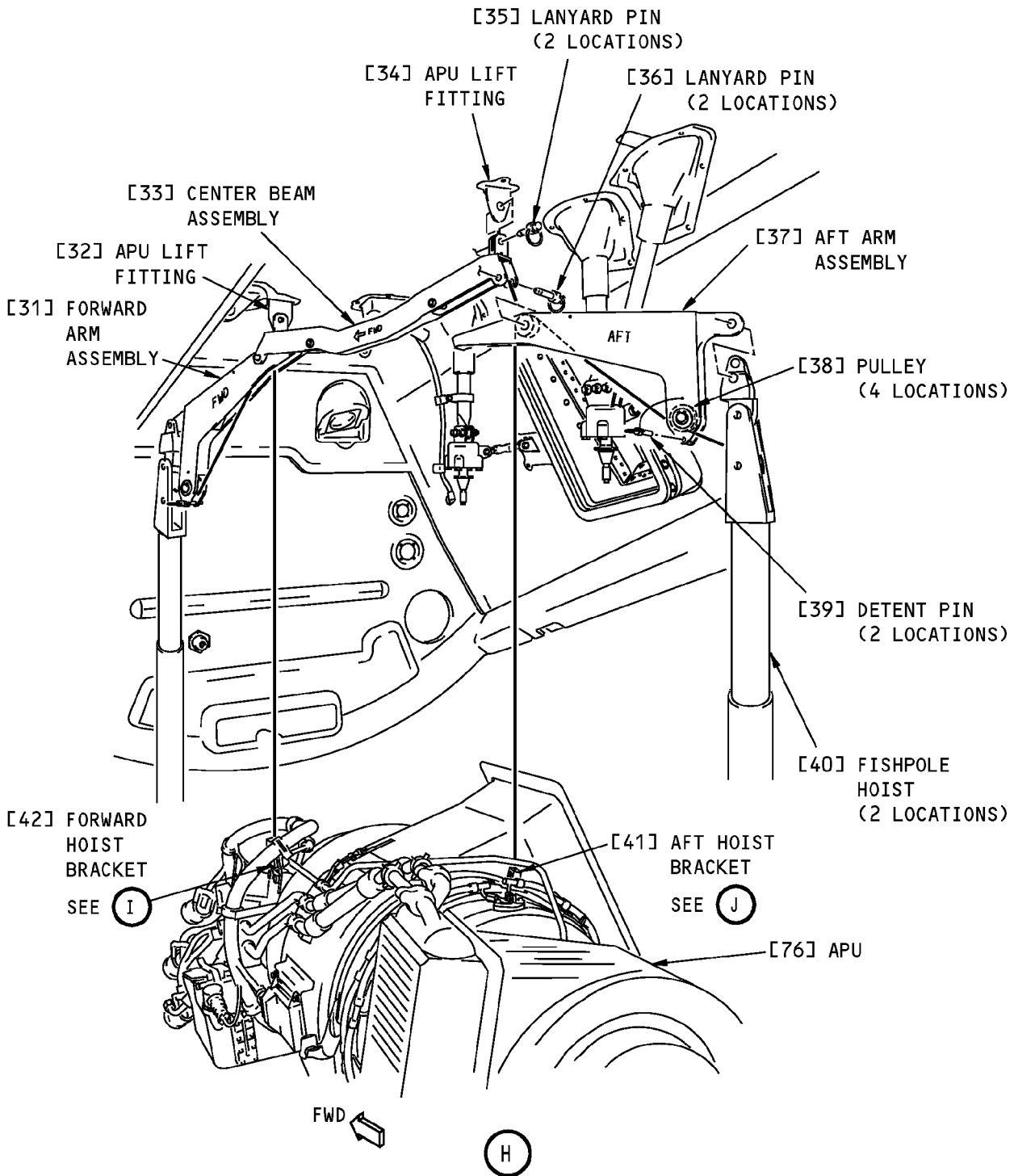
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**Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)  
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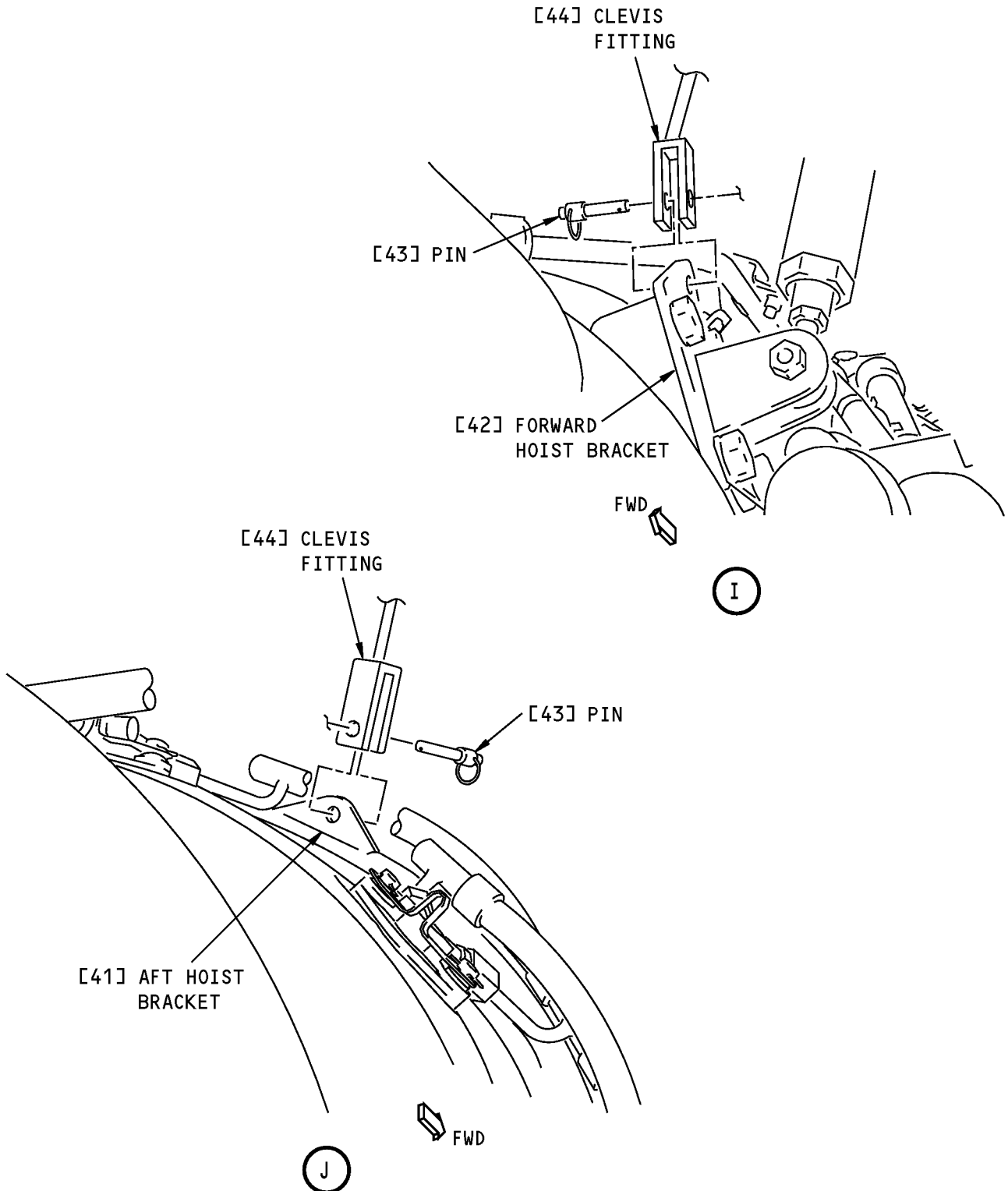
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**Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)**  
**Figure 401 (Sheet 6 of 11)/49-11-00-990-801**

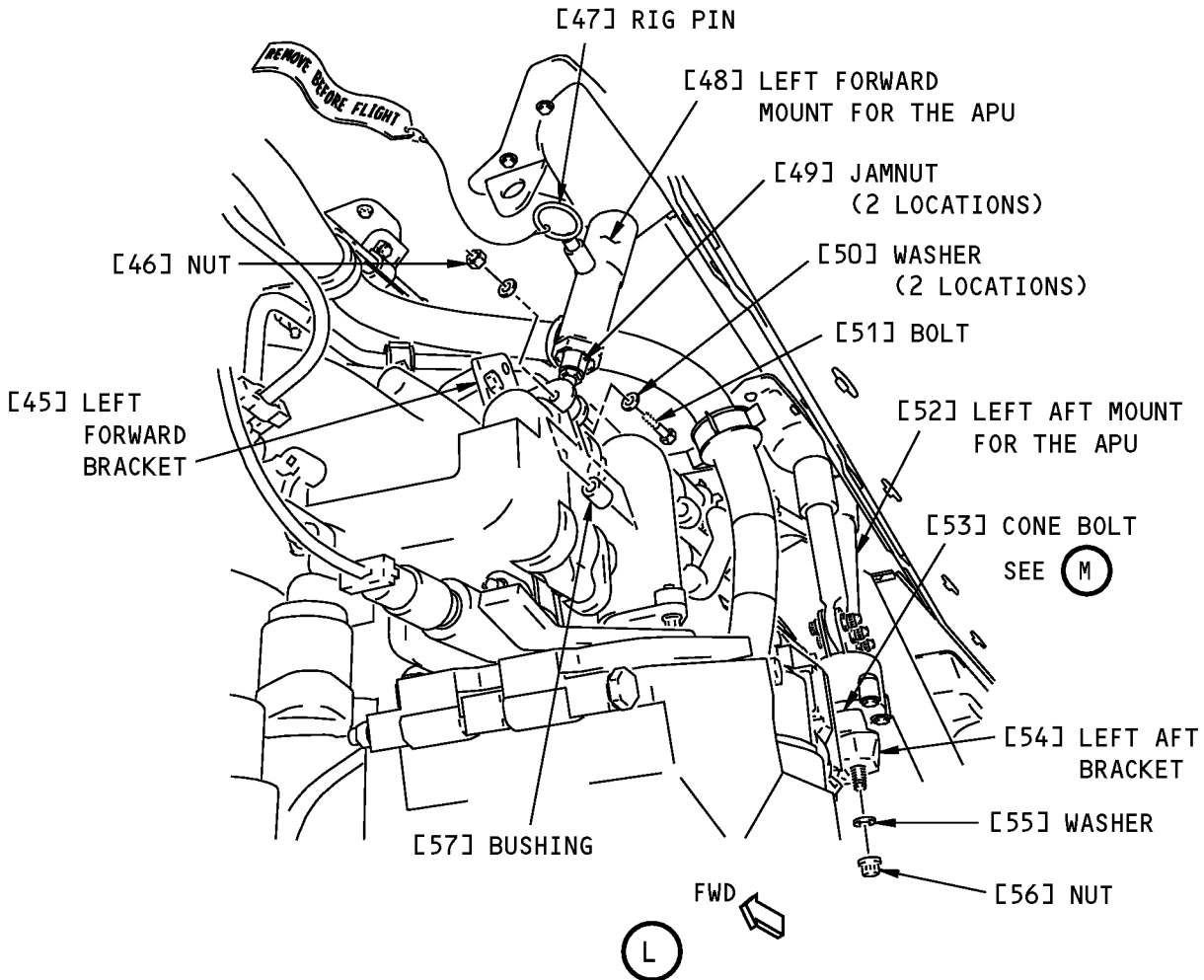
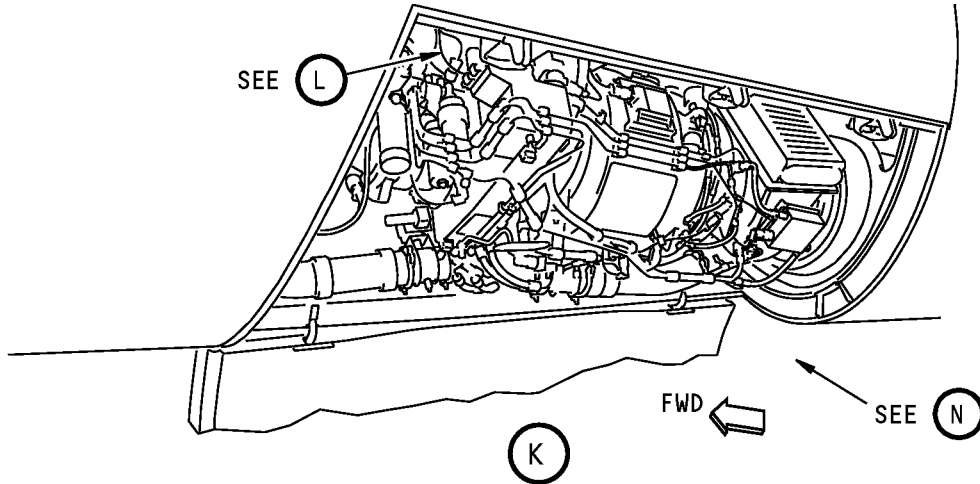
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**Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)**  
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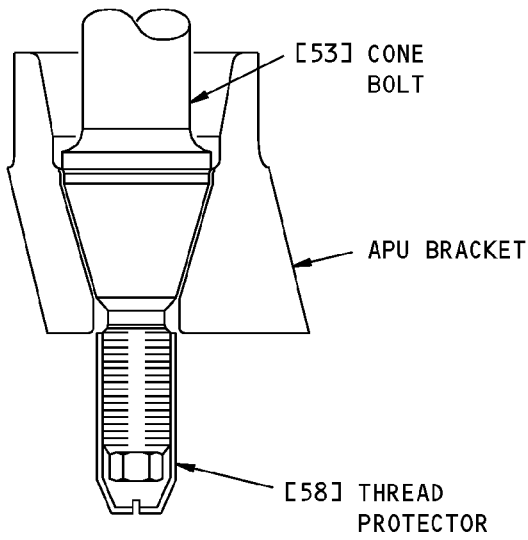
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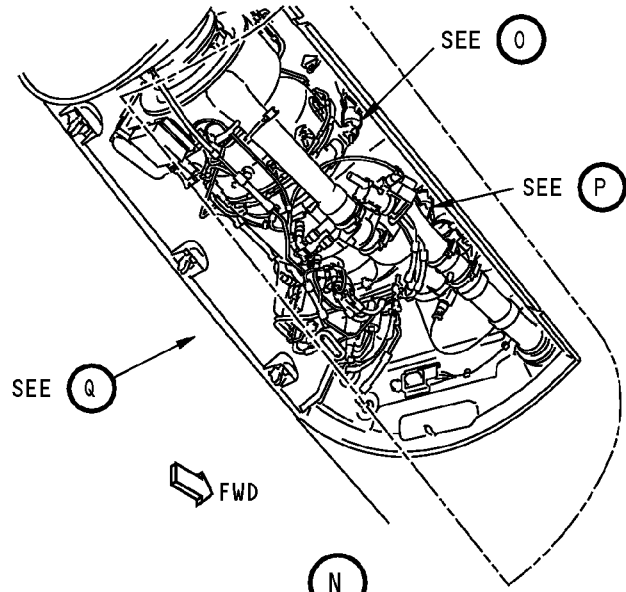
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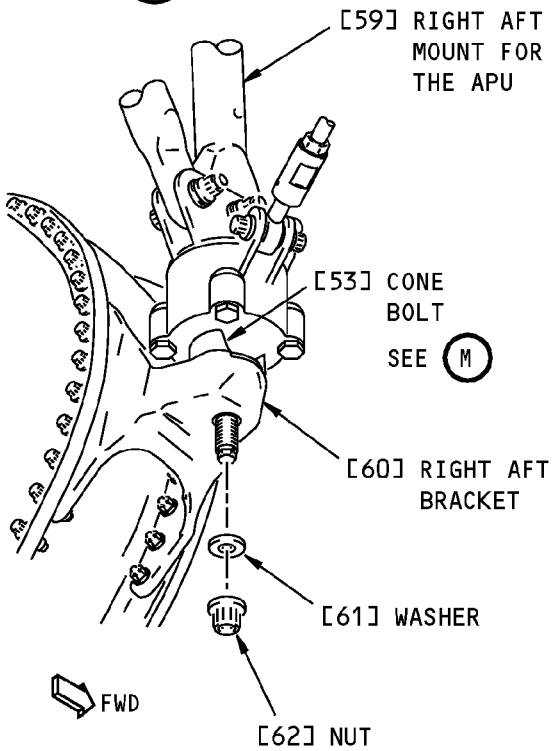
**AIRCRAFT MAINTENANCE MANUAL**



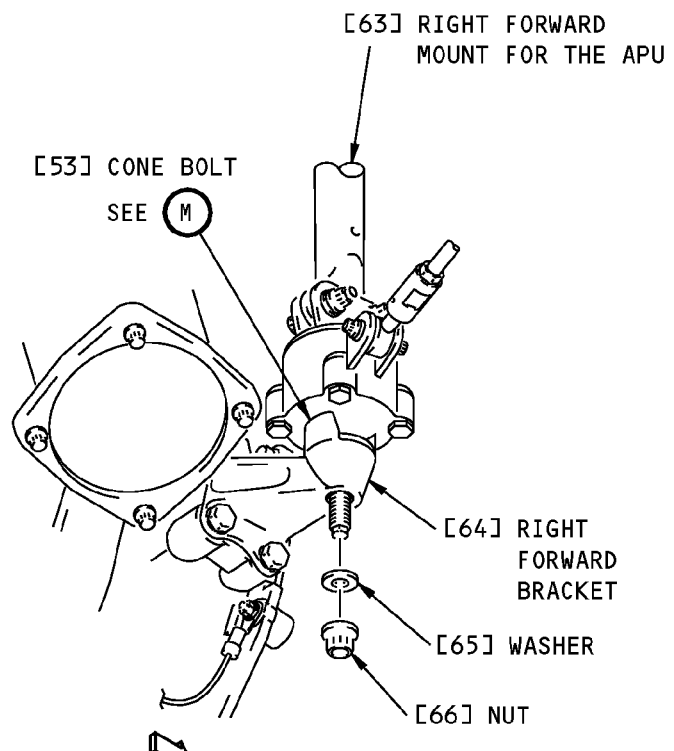
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(O)



(P)

**Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)**  
**Figure 401 (Sheet 8 of 11)/49-11-00-990-801**

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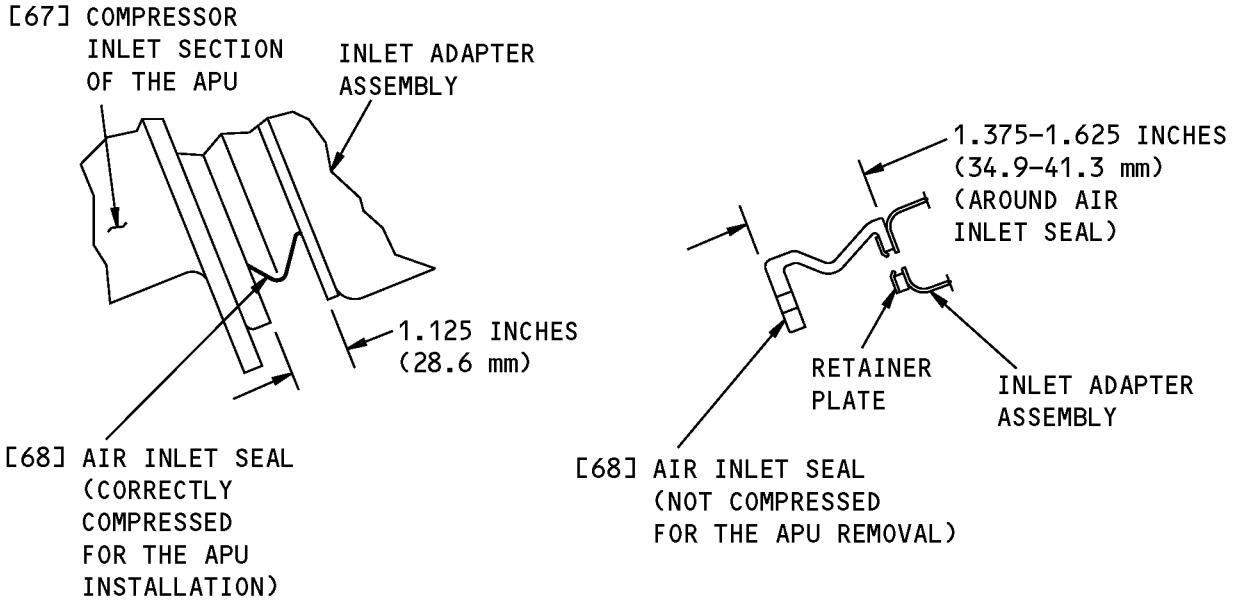
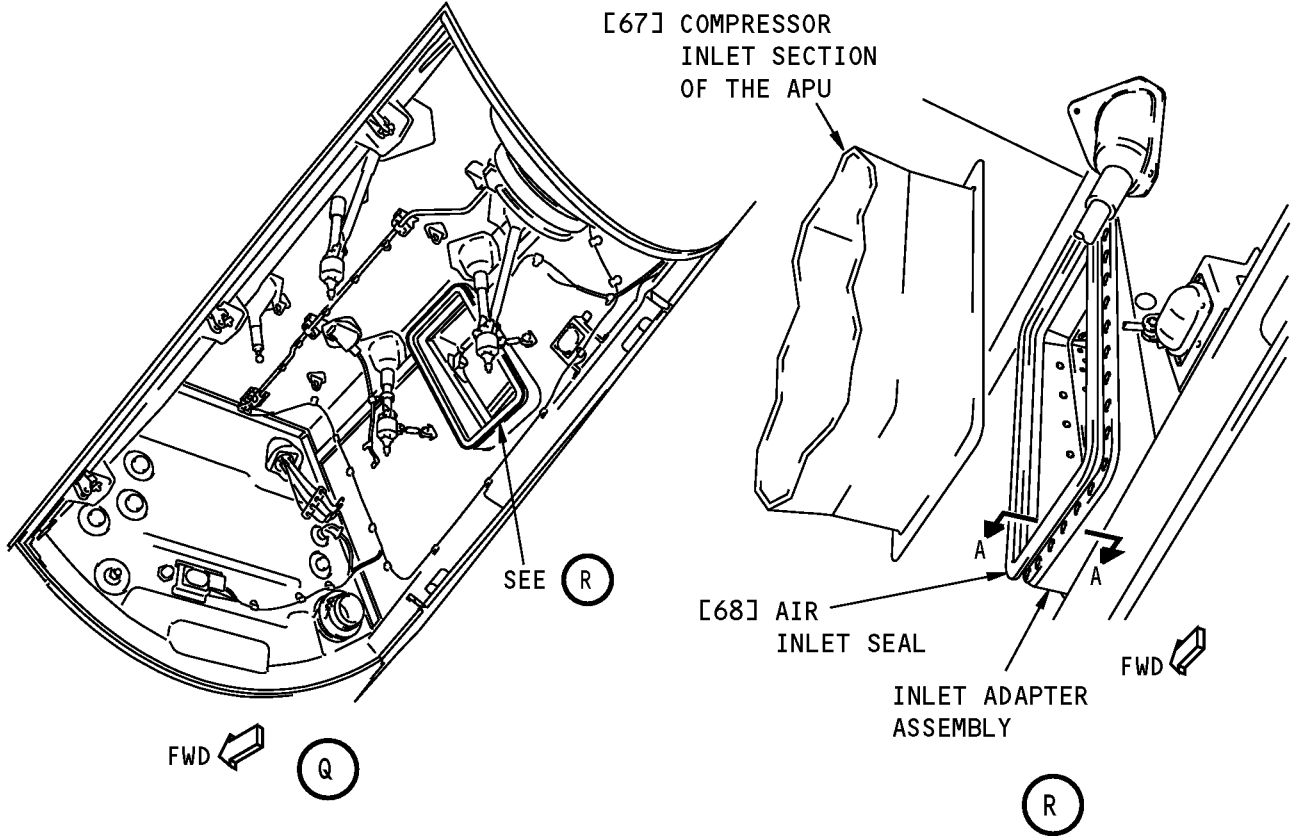
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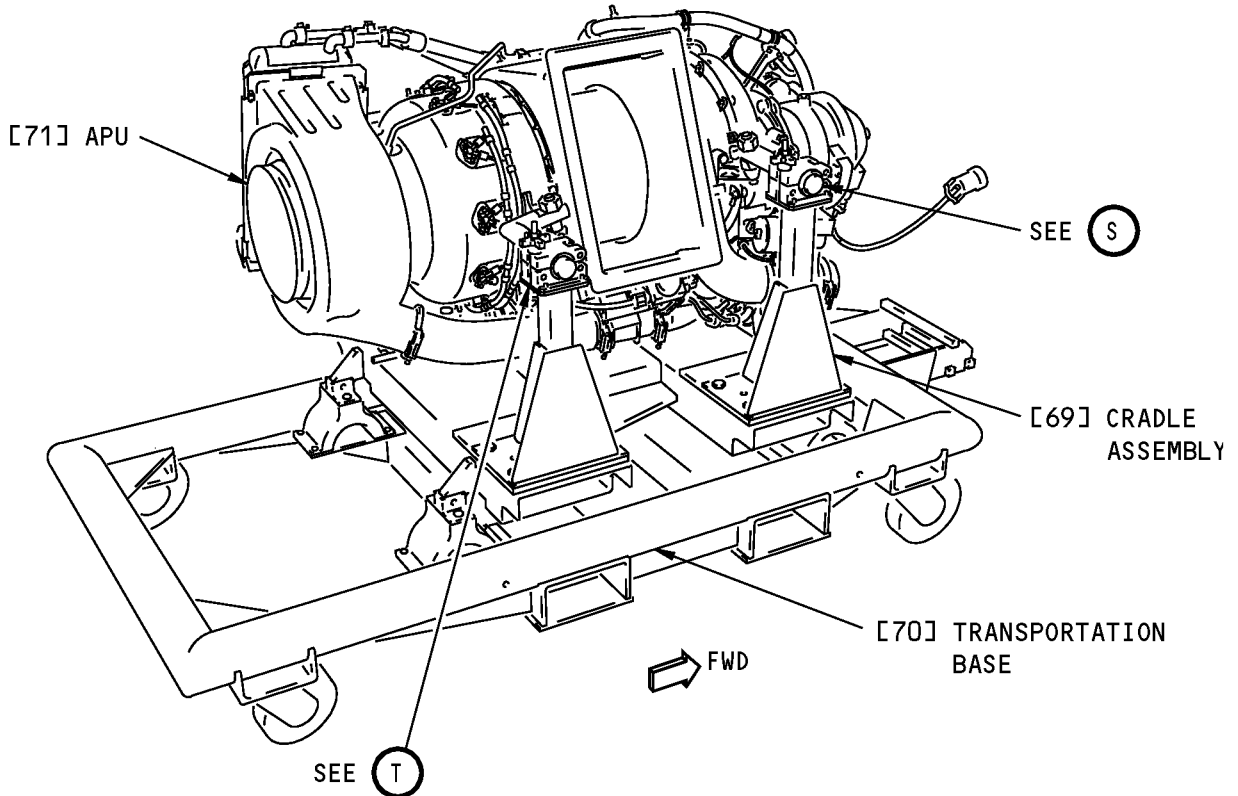
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**Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)**  
**Figure 401 (Sheet 9 of 11)/49-11-00-990-801**

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**Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)  
Figure 401 (Sheet 10 of 11)/49-11-00-990-801**

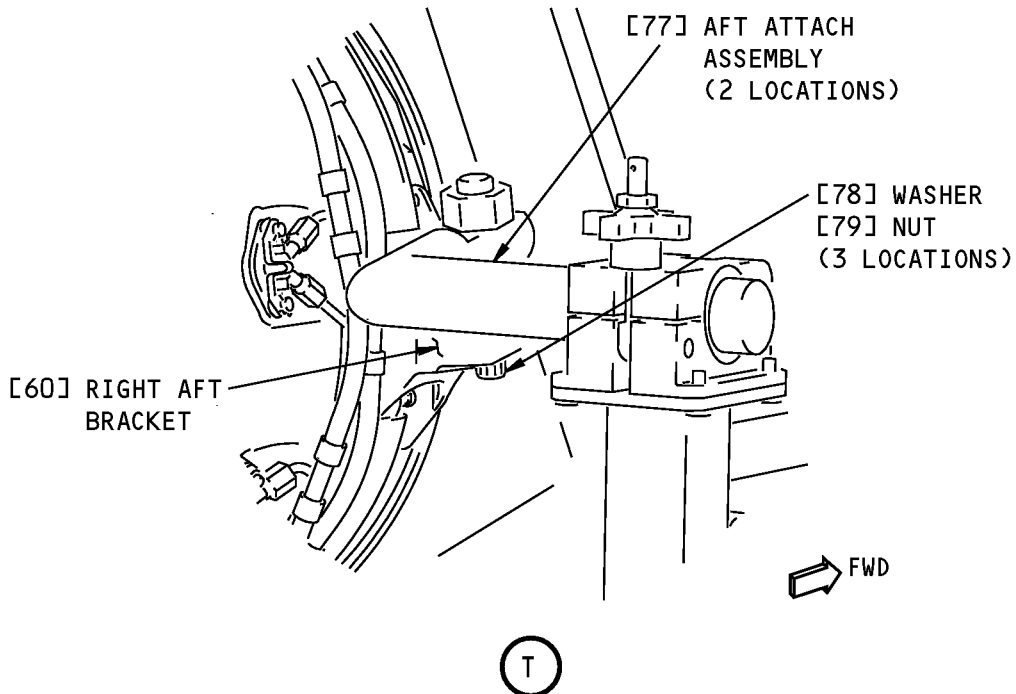
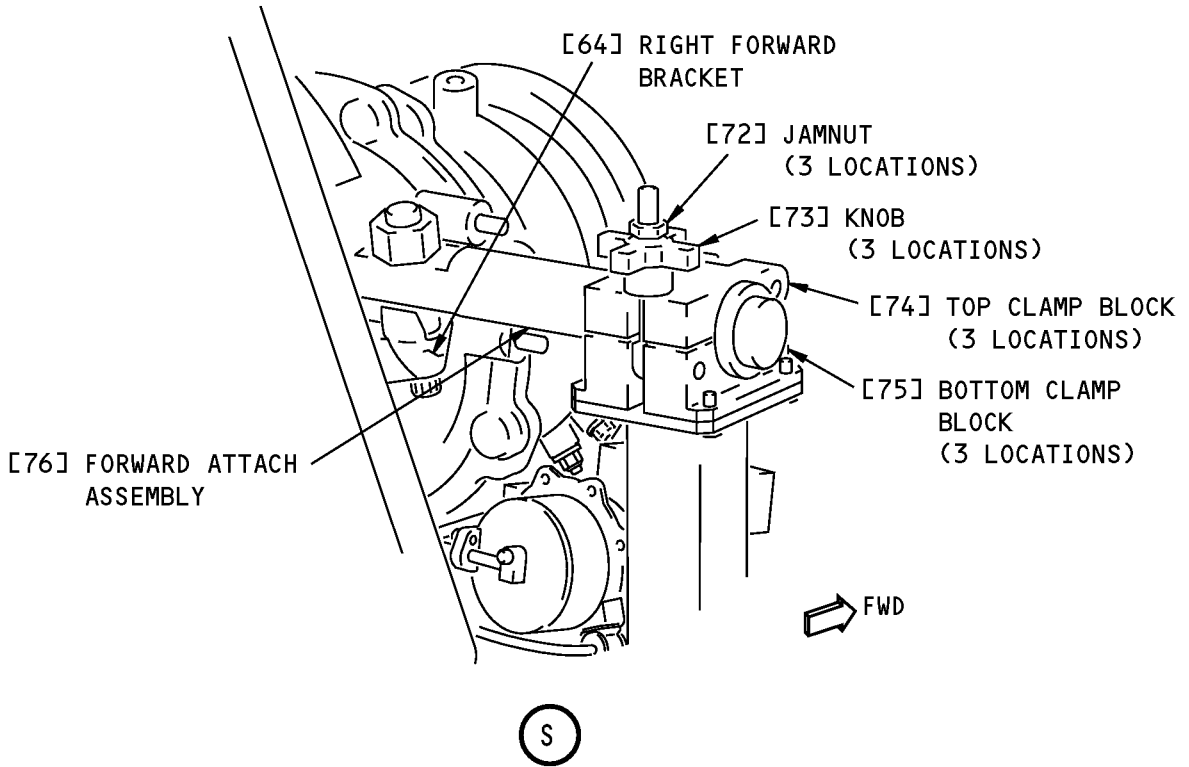
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Figure 401 (Sheet 11 of 11)/49-11-00-990-801**

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TASK 49-11-00-400-802

5. APU Power Plant Installation (Fishpole Hoist Procedure)

(Figure 401)

A. General

(1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-710-801	APU Operational Test (P/B 501)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-13-11-200-801	APU Mounts Inspection (APU Removed) (P/B 601)
49-17-11-200-801	Insulation Panel Inspection (P/B 601)
49-61-00-040-801	Low Oil Quantity BITE Deactivation (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
52-48-21-400-801	Auxiliary Power Unit (APU) Cowl Door Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1462	Hoist - Fishpole (Part #: 10/3641, Supplier: K1425, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -ALL, -BBJ) (Part #: F80039-1, Supplier: 81205, A/P Effectivity: 737-100, -200, -200C, -300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: PF51-003-1, Supplier: 06714, A/P Effectivity: 737-ALL) (Opt Part #: MINILIFT, Supplier: K1425, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -ALL, -BBJ)
COM-1550	Meter - Bonding (Approved Explosion Proof & Intrinsically Safe) (Part #: C15292 (MODEL T477W), Supplier: 01014, A/P Effectivity: 737-ALL) (Part #: M1, Supplier: 3AD17, A/P Effectivity: 737-ALL) (Part #: M1B, Supplier: 3AD17, A/P Effectivity: 737-ALL)
COM-1592	Hoist - Fishpole (chain) (Part #: AP6108, Supplier: 4Y309, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -ALL)
SPL-1957	Base - Transportation, APU (Part #: F72950-158, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-1968	Equipment - Hoist, Auxiliary Power Unit (AE131-9 APU) (Part #: C49007-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: C49007-20, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-1970	Assembly - Cradle, AE131-9B APU (Part #: C49010-50, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

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Reference	Description
SPL-1971	Protector - Thread, APU Mount Bolt (Part #: C49006-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-4157	Hoist - Fishpole, 500lb Capacity, 35 Foot Cable, 5 to 9 Foot Adjustable Telescoping Barrel (Part #: PF51-003-1, Supplier: 06714, A/P Effectivity: 737-ALL)
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1064	Scraper - Phenolic, Hard Resin
STD-1208	Lever - Wood, 2 Inch by 4 Inch, 4-7 Feet Long
STD-1242	Hammer - Standard
STD-3906	Mallet - Rubber

#### D. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00130	Alcohol - Isopropyl	TT-I-735
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G01048	Lockwire - Corrosion Resistant Steel (0.032 In. Dia.)	NASM20995~ C32
G50222	Brush - Stiff Bristle, Non-Metalic - Tampico GA55-1	

#### E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Fuel supply tube	49-31-11-01-035	HAP 001-013, 015-026, 028-030
7	Packing	49-31-11-02-030	HAP 031-054, 101-999
		49-31-11-01-020	HAP 001-013, 015-026, 028-030
		49-31-11-02-015	HAP 031-054, 101-999
11	Bleed air duct	49-52-11-01-012	HAP 001-013, 015-026, 028-030
		49-52-11-02-015	HAP 031-054, 101-999
29	Drain tube	49-91-21-01-035	HAP 001-013, 015-026, 028-030
		49-91-21-02-025	HAP 031-054, 101-999
71	APU	49-11-00-01-075	HAP 001-013, 015-026, 028-030
		49-11-00-02-085	HAP 031-054, 101-999

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## F. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

## G. Access Panels

Number	Name/Location
315A	APU Cowl Door

## H. Procedure

SUBTASK 49-11-00-210-003

- (1) Visually examine the four APU mounts [48], [52], [59], [63] for wear, cracks and damage.
  - (a) If you find wear, cracks or damage, do this task: APU Mounts Inspection (APU Removed), TASK 49-13-11-200-801.

SUBTASK 49-11-00-210-004

- (2) Visually examine the forward hoist bracket [42] and aft hoist bracket [41] on the APU for wear, cracks and damage.

SUBTASK 49-11-00-220-001

- (3) Measure the height of the air inlet seal [68] with the APU removed.

**NOTE:** The height from the bottom to the top of the air inlet seal [68] must be 1.375 in. (34.9 mm)-1.625 in. (41.3 mm).

SUBTASK 49-11-00-420-002

- (4) If it is necessary, remove the protection covers from the compressor inlet section of the APU and the APU exhaust duct.

## I. Fishpole Hoist Equipment Installation

SUBTASK 49-11-00-480-002

**WARNING:** MAKE SURE THE TWO FISHPOLE HOISTS ARE IN A SERVICEABLE CONDITION. THE TWO CABLES OR CHAINS OF THE TWO FISHPOLE HOISTS MUST SHOW NO SIGNS OF DAMAGE. YOU CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

**CAUTION:** FISHPOLE HOISTS WITH A CABLE AND DRUM ASSEMBLY;

MAKE SURE THE TWO CABLES OF THE TWO FISHPOLE HOISTS ARE EQUALLY WOUND AROUND THE DRUMS BEFORE YOU USE THE TWO FISHPOLE HOISTS TO HOLD THE APU. A CABLE THAT IS NOT EQUALLY WOUND CAN CAUSE THE APU TO FALL SUDDENLY. THIS CAN CAUSE DAMAGE TO THE APU.

- (1) Do these steps to install the two hoist, COM-1462, chain fishpole hoist, COM-1592 or fishpole hoist, SPL-4157 [40] to the forward hoist bracket [42] and aft hoist bracket [41] on the APU:
  - (a) Put the APU [71] in position below the APU compartment.
  - (b) Extend the two fishpole hoists [40] to a length that is easy to use.
  - (c) Unwind the two cables or chains of the two fishpole hoists until the two clevis fittings [44] align with the forward hoist bracket [42] and aft hoist bracket [41] on the APU.

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- (d) Install the two pins [43] that attach the two clevis fittings [44] to the forward hoist bracket [42] and aft hoist bracket [41].

**NOTE:** You install the pin into the aft hoist bracket and clevis fitting from the forward side of the APU.

- (e) Wind and tighten the two cables or chains of the two fishpole hoists.

**NOTE:** The weight of an APU is approximately 410 lb (186 kg).

### J. APU Installation

SUBTASK 49-11-00-420-003

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS IF NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Remove the protection covers from the compressor inlet section of the APU, APU exhaust duct and any other openings.

SUBTASK 49-11-00-080-007

- (2) Do these steps to remove the APU [71] from the assembly, SPL-1970, (cradle assembly) [69] and base, SPL-1957, (transportation base) [70]:

- (a) Make sure the two cables or chains of the two fishpole hoists are tight to hold the weight of the APU.
- (b) Loosen the three jamnuts [72] from the three knobs [73] on the cradle assembly [69].
- (c) Loosen the three knobs [73] until the three top clamp blocks [74] disengage the three bottom clamp blocks [75].
- (d) Open the three top clamp blocks [74].
- (e) Remove the three nuts [79] and three washers [78] that attach the left aft bracket [54], right aft bracket [60] and right forward bracket [64] to the cradle assembly [69].
- (f) Remove the forward attach assembly [76] from the right forward bracket [64].
- (g) Remove the two aft attach assemblies [77] from the left aft bracket [54] and right aft bracket [60].
- (h) Slowly wind the two cables or chains of the two fishpole hoists to lift the APU from the cradle assembly.
- (i) Close the three top clamp blocks [74].
- (j) Tighten the three knobs [73].
- (k) Tighten the three jamnuts [72] on the three knobs [73].
- (l) Remove the cradle assembly [69] and transportation base [70] from the area.

SUBTASK 49-11-00-420-004

- (3) Do these steps to install the APU [71] into the APU compartment:

- (a) Make sure the protector, SPL-1971, (thread protector) [58] are installed on the three cone bolts [53].
- (b) Lift the APU [71] into position:
  - 1) Hold the left aft mount [52] and right aft mount [59] in position.

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**CAUTION:** BE CAREFUL WHEN YOU MOVE THE APU IN THE APU COMPARTMENT. YOU MUST TILT THE APU APPROXIMATELY 10-15° IN THE FORWARD-END-DOWN POSITION WHILE THE APU IS IN THE APU COMPARTMENT. DAMAGE TO THE FUEL SUPPLY LINE, STARTER-GENERATOR WIRE HARNESS AND ENGINE WIRE HARNESS CAN OCCUR.

- 2) Tilt the APU [71] so that the forward end of the APU is lower than the aft end.

**NOTE:** When the APU [71] is installed, it is in the 11° forward-end-down position.

- 3) Slowly lift the APU [71] until the left aft bracket [54], right aft bracket [60] and right forward bracket [64] are below the three cone bolts [53].
- 4) Make sure the left aft mount [52], right aft mount [59] and right forward mount [63] are engaged at the same time.

**CAUTION:** CAREFULLY LIFT THE APU SO THAT YOU DO NOT DAMAGE THE CONED SURFACES OF THE APU MOUNTS.

- 5) Lift the APU [71] until the three cone bolts [53] are engaged.
- 6) Lift the APU [71] until the air inlet seal [68] is fully engaged with the compressor inlet section of the APU [67].

**NOTE:** The compressed area of the air inlet seal [68] must show no signs of buckling or caught on the edge of the compressor inlet section of the APU.

- 7) Measure the height of the compressed area of the air inlet seal [68] with the APU installed.

**NOTE:** The height from the bottom to the top of the air inlet seal (between the inlet adapter assembly and the APU) must be less than 1.125 in. (28.6 mm).

- (c) Connect the APU [71] to the left aft mount [52], right aft mount [59] and right forward mount [63]:

- 1) Remove the protector, SPL-1971, (thread protector) [58] from the three cone bolts [53].
- 2) Apply the Never-Seez NSBT-8N compound, D00006, to the threads of the three cone bolts [53].
- 3) Install the three washers [55], [61], [65] and three nuts [56], [62], [66] on the three cone bolts [53].
- 4) Do the torque limit test for the three nuts [56], [62], [66]:
  - a) Tighten the three nuts to a run-on torque of not more than 100 in-lb (11.3 N·m).
  - b) Stop when a minimum of one full thread and the cone bolt chamfer extends below each nut (but not before the washer touches the APU mount).
  - c) Make sure the break-away torque necessary to turn the three nuts from this position is more than 14 in-lb (1.6 N·m).
  - d) Replace the nut(s) that do not meet these torque limits.
  - e) If the nut(s) were replaced, do the torque limit test again for the new nut(s).
- 5) Tighten the three nuts [56], [62], [66] to 375 in-lb (42.4 N·m)-425 in-lb (48.0 N·m).

- (d) Connect the APU [71] to the left forward mount [48]:

- 1) Remove the nut [46], two washers [50] and bolt [51] from the left forward mount [48].
- 2) Make sure the bushing [57] is installed in the left forward mount [48].

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- 3) Install the rig pin [47] in the left forward mount [48].

NOTE: The rig pin is a component of the protector, SPL-1971.

- 4) Align the holes of the left forward bracket [45] to the left forward mount [48].
- 5) If the holes of the left forward bracket [45] and the left forward mount [48] do not align, adjust the left forward mount:

- a) Remove the lockwire, G01048, from the bottom jamnut [49] on the left forward mount [48].
- b) Turn the bottom jamnut [49] clockwise or counterclockwise until the holes of the left forward bracket [45] align with the left forward mount [48].

NOTE: One full turn of the jamnut will extend or retract the left forward mount a distance of 0.04 in. (1.0 mm).

- c) Make sure that you can see a minimum of one full thread from the bottom jamnut [49].
- d) If more adjustments are necessary, remove the seven screws and seven washers that attach the firewall cover to the top insulation panel.
- e) Move the firewall cover down until you can get access to the top jamnut [49].
- f) Remove the lockwire, G01048, from the top jamnut [49] on the left forward mount [48].
- g) Turn the top jamnut [49] clockwise or counterclockwise until the holes of the left forward bracket [45] align with the left forward mount [48].

NOTE: One full turn of the jamnut will extend or retract the left forward mount a distance of 0.04 in. (1.0 mm).

- h) Make sure that you can see a minimum of one full thread from the top jamnut [49].
- i) Tighten the jamnut(s) [49].
- j) Install the lockwire, G01048, on the jamnut(s) [49].
- k) Remove the remaining sealant from the surface of the firewall cover and the top insulation panel with a hard resin phenolic scraper, STD-1064, or an equivalent tool.

- l) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.

- m) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.

NOTE: It is recommended that you use a pressure of 60 psig (414 kPa)-90 psig (621 kPa) of air or nitrogen to dry the surface.

- n) Install the firewall cover to the top insulation panel with the seven washers and seven screws.
- o) Apply a fillet seal of sealant, A00160, around the firewall cover.
- p) Remove the unwanted sealant from the firewall cover and the top insulation panel with a cotton wiper, G00034.

NOTE: It is not necessary for the sealant to dry.

- 6) Install the bolt [51], two washers [50] and nut [46].

- 7) Remove the rig pin [47] from the left forward mount [48].

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### K. Fishpole Hoist Equipment Removal

SUBTASK 49-11-00-080-001

- (1) Do these steps to remove the two fishpole hoists [40] from the forward hoist bracket [42] and aft hoist bracket [41] on the APU:
  - (a) Remove the two pins [43] that attach the two clevis fittings [44] to the forward hoist bracket [42] and aft hoist bracket [41] on the APU.
  - (b) Wind the two cables or chains of the two fishpole hoists until the two clevis fittings [44] touch the forward and aft arm assemblies [31], [37].

SUBTASK 49-11-00-080-005

- (2) Do these steps to remove the forward and aft arm assemblies [31], [37] from the center beam assembly [33]:

**NOTE:** The forward arm assembly, center beam assembly and aft arm assembly are components of the equipment, SPL-1968.

- (a) While you hold the fishpole hoist [40] and forward arm assembly [31], remove the lanyard pin [36] that attaches the forward arm assembly [31] to the center beam assembly [33].
- (b) Remove the forward arm assembly [31] and fishpole hoist [40].
- (c) While you hold the fishpole hoist [40] and aft arm assembly [37], remove the lanyard pin [36] that attaches the aft arm assembly to the center beam assembly [33].
- (d) Remove the aft arm assembly [37] and fishpole hoist [40].
- (e) Install the two lanyard pins [36] to the forward and aft arm assemblies [31], [37].
- (f) Remove the two detent pins [39] from the forward and aft arm assemblies [31], [37].
- (g) Fully wind the two cables or chains of the two fishpole hoists.
- (h) Install the two detent pins [39] to the forward and aft arm assemblies [31], [37].
- (i) Remove the two fishpole hoists [40] from the forward and aft arm assemblies [31], [37].

SUBTASK 49-11-00-080-006

- (3) Do these steps to remove the center beam assembly [33] from the two APU lift fittings [32], [34]:
  - (a) Remove the two lanyard pins [35] that attach the center beam assembly [33] to the two APU lift fittings [32], [34].

**CAUTION:** BE CAREFUL WHEN YOU REMOVE THE CENTER BEAM ASSEMBLY FROM THE APU COMPARTMENT. YOU CAN TILT THE CENTER BEAM ASSEMBLY AS NECESSARY TO PREVENT THE CENTER BEAM ASSEMBLY FROM TOUCHING THE FIRE DETECTOR ASSEMBLY. DAMAGE TO THE FIRE DETECTOR ASSEMBLY AND WIRING CAN OCCUR.

- (b) Remove the center beam assembly [33].

**NOTE:** You can remove the center beam assembly from the rear side or front side of the APU.

- (c) Install the two lanyard pins [35] to the center beam assembly [33].

### L. APU Connections

SUBTASK 49-11-00-420-005

- (1) Do these steps to connect the exhaust duct muffler [23]:
  - (a) Make sure the exhaust duct muffler [23] touches the APU.
    - 1) Pull the exhaust duct muffler [23] forward to the APU until the exhaust duct muffler touches the APU.

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- 2) If it is necessary, use a 2 inch by 4 inch, 4-7 feet long wood lever, STD-1208, and standard hammer, STD-1242, to lightly tap the exhaust duct muffler [23] forward to the APU until the exhaust duct muffler touches the APU.
- (b) If the exhaust duct muffler [23] does not touch the APU or the flanges are not aligned, do these steps to make sure the exhaust duct muffler touches the APU:
  - 1) Loosen the 16 bolts [24] that attach the seal depressor assembly [25] to the 1156 bulkhead.
  - 2) Move the exhaust duct muffler [23] until the exhaust duct muffler touches the APU.
  - 3) If more adjustments are necessary, loosen the 20 screws [28] that attach the seal support assembly [26] to the exhaust duct muffler [23].
  - 4) Move the exhaust duct muffler [23] until the exhaust duct muffler touches the APU and the flanges are aligned.
- (c) Install the V-band clamp [27] on the exhaust duct muffler [23]:
  - 1) Put the V-band clamp [27] on the exhaust duct muffler [23].
  - 2) Tighten the V-band clamp [27] to 70 in-lb (7.9 N·m)-90 in-lb (10.2 N·m).
  - 3) Lightly hit the edge of the V-band clamp [27] with a rubber mallet, STD-3906.
  - 4) Continue to tighten and hit the V-band clamp [27] until the torque value stays constant.
- (d) If the 20 screws [28] were loosened during the adjustment of the exhaust duct muffler [23], tighten the 20 screws on the seal support assembly [26].
- (e) If the 16 bolts [24] were loosened during the adjustment of the exhaust duct muffler [23], tighten the 16 bolts on the seal depressor assembly [25].

SUBTASK 49-11-00-420-006

- (2) Do these steps to install the drain tube [29] for the exhaust duct muffler:
  - (a) Remove the caps or plugs from the drain tube [29], fitting [30] on the exhaust duct muffler and fitting [80] on the aft drain tube of the APU.
  - (b) Apply a thin layer of Never-Seez NSBT-8N compound, D00006, on the threads of the fitting [30] and fitting [80].
  - (c) Connect the drain tube [29] to the fitting [80] on the aft drain tube of the APU.
  - (d) Connect the drain tube [29] to the fitting [30] on the exhaust duct muffler.
  - (e) Tighten the two ends of the drain tube [29] to 230 in-lb (26.0 N·m).

SUBTASK 49-11-00-420-007

- (3) Do these steps to connect the bonding jumper [20]:
  - (a) Clean the surfaces of the two studs:
    - 1) Apply alcohol, B00130, to a Tamico GA55-1 brush, G50222, or cotton wiper, G00034.
    - 2) Use a small amount of pressure on the Tamico GA55-1 brush, G50222, or cotton wiper, G00034 while you clean the surfaces of the two studs.
    - 3) Continue to clean the surfaces until there are no visible residue on the surfaces.
  - (b) Connect the bonding jumper [20] to the two studs with the two washers [22] and two nuts [21]:
    - 1) Tighten the two nuts [21].
    - 2) Use an bonding meter, COM-1550, to make sure the bonding resistance between the APU and the airplane structure is 0.0025 ohm or less.

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SUBTASK 49-11-00-420-008

- (4) Do these steps to connect the four terminal lugs [14], [16], [17], [18]:
- Disengage the terminal block cover [19] from the four pins on the starter-generator.
  - Remove the terminal block cover [19].
  - Remove the four nuts [12] from the four terminal studs.
  - Connect the four terminal lugs (T1) [18], (T2) [17], (T3) [16] and (T4) [14] to the related terminal studs.

**NOTE:** The terminal strip and the fanning strip [15] show the identification of the terminal studs for each of the terminal lugs (T1), (T2), (T3) and (T4).

- Install the four nuts [12] on the four terminal studs.
  - Tighten the four nuts [12] to 115 in-lb (13.0 N·m)-135 in-lb (15.3 N·m).
- Put the terminal block cover [19] on the starter-generator.
- Engage the terminal block cover [19] to the four pins on the starter-generator.

SUBTASK 49-11-00-420-009

- (5) Do these steps to install the bleed air duct [11]:
- Install the two seals [10] on the bleed air duct [11].
  - Put the two coupling clamps [9] on the bleed air valve and bleed duct assembly.

**NOTE:** The bleed duct assembly extends through the 1088 bulkhead.

- Put the bleed air duct [11] in its position.

**NOTE:** To install the bleed air duct [11], make sure the directional flow arrow points away from the front of the APU.

  - Open the two coupling clamps [9] to permit the two alignment marks on the bleed air duct [11] to align with the alignment mark on the bleed air valve and the bleed duct assembly.
  - Make sure the alignment marks on the two flexible couplings align with the two alignment marks on the bleed air duct [11].
  - Make sure the center of the alignment mark on the bleed air duct [11] is  $\pm 0.16$  in. (4.1 mm) from the center of the alignment mark on the bleed air valve.
- Put the two coupling clamps [9] over the flanges of the bleed air valve, bleed air duct [11] and bleed duct assembly.
  - Tighten the two coupling clamps [9] to 95 in-lb (10.7 N·m)-110 in-lb (12.4 N·m).

SUBTASK 49-11-00-420-010

- (6) Do these steps to install the fuel supply tube [5]:
- Remove the caps or plugs from the fuel supply tube [5], fitting [6] and fuel control unit.
  - Lubricate the two new packings [7] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
  - Install the two packings [7] on the fuel supply tube [5].
  - Connect the fuel supply tube [5] to the fuel control unit.
  - Turn the tube retainer on the fuel supply tube [5] clockwise until the flange fully engages the stud.
  - Tighten the nut [8] to 40 in-lb (4.5 N·m).
  - Apply a thin layer of aircraft turbine engine oil, D50055, on the threads of the fitting [6].

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(h) Connect the fuel supply tube [5] to the fitting [6] on the 1088 bulkhead.

SUBTASK 49-11-00-420-011

(7) Do these steps to connect the four electrical connectors [1], [2], [3], [4] to the APU firewall receptacles on the 1088 bulkhead:

- (a) Remove the caps from the electrical connectors.
(b) Connect the electrical connector D11118 (P4) [4].
(c) Connect the electrical connector D10434 (P3) [3].
(d) Connect the electrical connector D10912 (P1) [2].
(e) Connect the electrical connector D10436 (P2) [1].

M. APU Installation Test

SUBTASK 49-11-00-410-001

(1) If the APU cowl door was removed, do this task: Auxiliary Power Unit (APU) Cowl Door Installation, TASK 52-48-21-400-801.

NOTE: Do not close the APU cowl door at this time. Use the two hold-open rods to hold the APU cowl door open.

SUBTASK 49-11-00-210-009

- (2) Do a general visual inspection of the seven insulation panels:
(a) Visually examine the seven insulation panels that you can get access from the APU compartment for holes, tears, separation and damage.
(b) If you find holes, tears, separation or damage on the insulation panels, do this task: Insulation Panel Inspection, TASK 49-17-11-200-801.

SUBTASK 49-11-00-860-008

(3) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Table with 4 columns: Row, Col, Number, Name. Row B, Col 19, Number C01344, Name APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Table with 4 columns: Row, Col, Number, Name. Row A, Col 14, Number C00033, Name AUX POWER UNIT CONT

SUBTASK 49-11-00-860-009

(4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-11-00-710-001

- (5) Do the installation test for the APU:
(a) Do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.
(b) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
(c) During the APU operation, examine the APU for signs of oil and fuel leakage.

NOTE: A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted during an APU operation from the forward drain on the APU drain seal.

(d) If you find oil leakage or more than the fuel leakage rate, do these steps to repair the leakage:

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- 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
  - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
  - 3) Repair the cause of the fuel or oil leakage.
  - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
  - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - 6) During the APU operation, examine the APU for signs of oil and fuel leakage.
  - 7) If you find oil leakage or more than the fuel leakage rate, do the leakage repair again.
- (e) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
- 1) If maintenance message(s) show for the APU, refer to the applicable Maintenance Message Index in the FIM.
  - 2) Look at the IDENT/CONFIG page on the control display unit (CDU) display for the APU HOURS.
  - 3) If it is necessary to set the APU HOURS to 0.0, then do these steps:
    - a) Push the line select key 6R adjacent to RESET HOURS SINCE INSTALLATION > .  
NOTE: The DO YOU WANT TO RESET THE HOURS SINCE INSTALLATION ON THIS AIRPLANE? shows on the CDU display.
    - b) Push the line select key 5R adjacent to YES > .  
NOTE: You push the line select key 2R adjacent to NO > if it is not necessary to set the APU HOURS to 0.0 or to go back to the IDENT/CONFIG page.
  - 4) If you have installed a new APU and prefer the LOQ BITE to be deactivated, do this task: Low Oil Quantity BITE Deactivation, TASK 49-61-00-040-801.
- (f) Do this task: APU Operational Test, TASK 49-11-00-710-801.

### N. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-00-410-002

- (1) Close this APU cowl door. To close this APU cowl door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU cowl door.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU cowl door.
- (g) Close the three latches.

————— END OF TASK —————

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**TASK 49-11-00-000-803**

**6. APU Power Plant Removal (Hydraulic Jack Procedure)**

(Figure 402)

**A. General**

(1) This procedure is a scheduled maintenance task.

**B. References**

Reference	Title
21-00-01-100-801	Oil Contamination Removal from Air Conditioning and Pneumatic Systems (P/B 201)
36-13-01-100-801	Pneumatic Duct Cleaning (P/B 701)
49-15-11-200-801	Air Inlet Seal Inspection (P/B 601)
49-15-15 P/B 401	APU AIR INLET PLENUM - REMOVAL/INSTALLATION
49-17-11-200-801	Insulation Panel Inspection (P/B 601)
49-81-11-200-801	Exhaust Duct Muffler Inspection (P/B 601)
49-91-71-200-801	Eductor Inlet Duct Inspection (P/B 601)
52-48-21-000-801	Auxiliary Power Unit (APU) Cowl Door Removal (P/B 401)

**C. Tools/Equipment**

**NOTE:** When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1561	Jack - Hydraulic (Part #: J20009-38, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Opt Part #: J20009-78, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-1957	Base - Transportation, APU (Part #: F72950-158, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-1969	Sling - Shop Handling, used with AlliedSignal AE131-9 APU (Part #: C49004-40, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-1970	Assembly - Cradle, AE131-9B APU (Part #: C49010-50, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-1971	Protector - Thread, APU Mount Bolt (Part #: C49006-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-1972	Equipment - Adapter, APU Jacking (Part #: C49008-37, Supplier: 81205, A/P Effectivity: 737-100, -200, -200C, -300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

**D. Location Zones**

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

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Zone	Area
316	APU Compartment - Right

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Prepare for the Removal

SUBTASK 49-11-00-860-010

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-11-00-860-011

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-010-015

- (3) If it is necessary to remove the APU Cowl Door, 315A, do this task: Auxiliary Power Unit (APU) Cowl Door Removal, TASK 52-48-21-000-801.

SUBTASK 49-11-00-010-003

- (4) If it is not necessary to remove the APU Cowl Door, 315A, open this access door. To open this access door, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

G. Adapter and Hydraulic Jack Installation

SUBTASK 49-11-00-480-003

- (1) Position the equipment, SPL-1972, (adapter) [101] on the hydraulic jack, SPL-1561, (jack assembly) [105].

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SUBTASK 49-11-00-480-004

- (2) Install the four bolts [104], four washers [103] and four nuts [102] that attach the equipment, SPL-1972, (adapter) [101] to the hydraulic jack, SPL-1561, (jack assembly) [105].

### H. Disconnect the APU Power Plant

SUBTASK 49-11-00-020-012

- (1) Do these steps to disconnect the four electrical connectors [1], [2], [3], [4] from the APU firewall receptacles on the 1088 bulkhead:
  - (a) Disconnect the electrical connector D10436 (P2) [1].
  - (b) Disconnect the electrical connector D10912 (P1) [2].
  - (c) Disconnect the electrical connector D10434 (P3) [3].
  - (d) Disconnect the electrical connector D11118 (P4) [4].
  - (e) Install the caps on the electrical connectors to prevent contamination.

SUBTASK 49-11-00-020-013

**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Do these steps to remove the fuel supply tube [5]:
  - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, under the fuel supply tube [5].
  - (b) Disconnect the fuel supply tube [5] from the fitting [6] on the 1088 bulkhead.
  - (c) Drain the fuel from the fuel supply tube [5] into the 1 gallon (4 l) fuel resistant container, STD-4049.
  - (d) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the fuel control unit.
  - (e) Loosen the nut [8] that attaches the fuel supply tube [5] to the fuel control unit.
  - (f) Turn the tube retainer on the fuel supply tube [5] counterclockwise until the flange disengages from the stud.
  - (g) Disconnect the fuel supply tube [5] from the fuel control unit.
  - (h) Drain the fuel from the fuel supply tube [5] into the 1 gallon (4 l) fuel resistant container, STD-4049.
  - (i) Remove the fuel supply tube [5].
  - (j) Remove the two packings [7] from the fuel supply tube [5].
    - 1) Discard the two packings [7].
  - (k) Install the caps or plugs on the fuel supply tube [5], fitting [6] and fuel control unit.
  - (l) Install a protection cover on the fuel supply tube [5] to prevent contamination.
  - (m) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

SUBTASK 49-11-00-020-014

- (3) Do these steps to remove the bleed air duct [11]:
  - (a) Remove the two coupling clamps [9] that hold the bleed air duct [11] to the bleed air valve and bleed duct assembly.

**NOTE:** The bleed duct assembly extends through the 1088 bulkhead.
  - (b) Remove the bleed air duct [11].

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**CAUTION:** BE CAREFUL WHEN YOU REMOVE THE TWO SEALS FROM THE BLEED AIR DUCT. DAMAGE TO THE SEALS CAN OCCUR.

- (c) Carefully remove the two seals [10] from the bleed air duct [11].
- (d) Install the protection covers on the bleed duct assembly, bleed air duct [11], two seals [10] and bleed air valve to prevent contamination.

SUBTASK 49-11-00-020-015

- (4) Do these steps to disconnect the four terminal lugs [14], [16], [17], [18]:
  - (a) Disengage the terminal block cover [19] from the four pins on the starter-generator.
  - (b) Remove the terminal block cover [19].
  - (c) Remove the four nuts [12] from the four terminal studs.
  - (d) Disconnect the four terminal lugs (T1) [18], (T2) [17], (T3) [16] and (T4) [14] from the four terminal studs.

**NOTE:** The terminal strip and the fanning strip [15] show the identification of the terminal studs for each of the terminal lugs (T1), (T2), (T3) and (T4).

- (e) Install the four nuts [12] on the four terminal studs.
- (f) Install the terminal block cover [19] on the starter-generator:
  - 1) Put the terminal block cover [19] on the starter-generator.
  - 2) Engage the terminal block cover [19] to the four pins on the starter-generator.

SUBTASK 49-11-00-020-016

- (5) Do these steps to disconnect the bonding jumper [20]:
  - (a) Remove the two nuts [21] and two washers [22] that attach the bonding jumper [20] to the APU.
  - (b) Disconnect the bonding jumper [20] from the two studs.
  - (c) Keep the two nuts [21] and two washers [22] for the replacement APU.

SUBTASK 49-11-00-020-017

- (6) Do these steps to remove the drain tube [29] for the exhaust duct muffler:
  - (a) Disconnect the drain tube [29] from the fitting [30] on the exhaust duct muffler [23].
  - (b) Disconnect the drain tube [29] from the fitting [80] on the aft drain tube of the APU.
  - (c) Remove the drain tube [29].
  - (d) Install the caps or plugs on the drain tube [29], fitting [30] and fitting [80].
  - (e) Install a protection cover on the drain tube [29] to prevent contamination.

SUBTASK 49-11-00-020-018

- (7) Do these steps to disconnect the exhaust duct muffler [23]:
  - (a) Remove the V-band clamp [27] from the exhaust duct muffler [23].
  - (b) Disconnect and move the exhaust duct muffler [23] aft about 0.25 inch (6.4 mm) from the APU.

### I. APU Power Plant Removal

SUBTASK 49-11-00-480-005

- (1) Do these steps to attach the equipment, SPL-1972, (adapter) [101] to the APU:
  - (a) Put the adapter [101] and hydraulic jack, SPL-1561, (jack assembly) [105] on the maintenance stand.
    - 1) Make sure the jack assembly [105] is centered under the APU.

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- (b) Lift the maintenance stand to the APU compartment.
- (c) Lift the jack assembly [105] until the adapter [101] and the three ground handling mounts [106] are engaged.
- (d) Install the three pins [107] that attach the adapter [101] to the three ground handling mounts [106].
- (e) Install the three spring clips [108] in the three pins [107].
- (f) Use the jack assembly [105] to lift the APU sufficiently to remove the weight of the APU from the four APU mounts.

SUBTASK 49-11-00-020-019

(2) Do these steps to disconnect the APU from the four APU mounts [48], [52], [59], [63]:

- (a) Disconnect the left forward mount [48]:
  - 1) Remove the nut [46], two washers [50] and bolt [51] from the left forward bracket [45].
  - 2) Disconnect the left forward mount [48] from the left forward bracket [45].
  - 3) Let the left forward mount [48] hang vertically.
  - 4) Make sure the bushing [57] is installed in the left forward mount [48].
  - 5) Install the bolt [51], two washers [50] and nut [46] on the left forward mount [48].
- (b) Disconnect the left aft mount [52], right aft mount [59] and right forward mount [63]:
  - 1) Remove the nut [56] and washer [55] from the cone bolt [53] on the left aft mount [52].
  - 2) Remove the nut [62] and washer [61] from the cone bolt [53] on the right aft mount [59].
  - 3) Remove the nut [66] and washer [65] from the cone bolt [53] on the right forward mount [63].

**WARNING:** MAKE SURE THE THREAD PROTECTORS ARE FULLY ENGAGED ON THE CONE BOLTS. IF THE THREAD PROTECTORS ARE NOT FULLY ENGAGED, THE APU BRACKETS CAN GET CAUGHT ON THE THREAD PROTECTORS. THIS CAN CAUSE THE APU TO MOVE SUDDENLY. A SUDDEN MOVEMENT OF THE APU CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- 4) Install the protector, SPL-1971, (thread protector) [58] on the three cone bolts [53].

**NOTE:** The cone bolt is a part of the vibration isolator for the APU mount.

SUBTASK 49-11-00-020-020

(3) Do these steps to remove the APU [71]:

**CAUTION:** BE CAREFUL WHEN YOU MOVE THE APU IN THE APU COMPARTMENT. YOU MUST TILT THE APU APPROXIMATELY 10-15° IN THE FORWARD-END-DOWN POSITION WHILE THE APU IS IN THE APU COMPARTMENT. DAMAGE TO THE FUEL SUPPLY LINE, STARTER-GENERATOR WIRE HARNESS AND ENGINE WIRE HARNESS CAN OCCUR.

- (a) Tilt the APU [71] so that the forward end of the APU is lower than the aft end.

**NOTE:** When the APU is installed, it is in the 11° forward-end-down position.

- (b) Slowly lower the APU [71] out of the APU compartment.

**NOTE:** The weight of an APU [71] is approximately 410 pounds (186 kg).

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**CAUTION:** DO NOT USE THE C49008-37 ADAPTER AND J20009-38 JACK ASSEMBLY TO MOVE THE APU TO A DIFFERENT AREA. USE THE C49010-50 CRADLE ASSEMBLY AND THE F72950-158 TRANSPORTATION BASE TO MOVE THE APU TO A DIFFERENT AREA. DAMAGE TO THE TWO GROUND HANDLING MOUNTS AT THE BOTTOM FORWARD END OF THE APU CAN OCCUR.

- (c) Move the APU [71] away from the APU compartment and the maintenance stand.
- (d) Make sure the two rings [111] and two bow shackles [110] are attached to the sling, SPL-1969 [109].
- (e) Attach the two bow shackles [110] of the sling, SPL-1969, to the forward hoist bracket [42] and aft hoist bracket [41] on the APU.
- (f) Use the sling, SPL-1969, [109] to lift the APU [71] sufficiently to remove the weight of the APU from the hydraulic jack, SPL-1561, (jack assembly) [105].
- (g) Remove the four nuts [102], four washers [103] and four bolts [104] that attach the equipment, SPL-1972, (adapter) [101] to the jack assembly [105].
- (h) Remove the jack assembly [105].
- (i) Remove the adapter [101] from the APU:
  - 1) Remove the three spring clips [108] from the three pins [107].
  - 2) Remove the three pins [107] that attach the adapter [101] to the three ground handling mounts [106].
  - 3) Remove the adapter [101].
- (j) Install the forward attach assembly [76] on the right forward bracket [64] with the washer [78] and nut [79].

**NOTE:** The assembly, SPL-1970, (cradle assembly) [69] has these three components - a forward attach assembly and two aft attach assemblies. These components attach the three APU brackets to the cradle assembly.

- (k) Install the two aft attach assemblies [77] on the left aft bracket [54] and right aft bracket [60] with the two washers [78] and two nuts [79].
- (l) Loosen the three jamnuts [72] from the three knobs [73] on the cradle assembly [69].
- (m) Loosen the three knobs [73] until the three top clamp blocks [74] disengage from the three bottom clamp blocks [75].
- (n) Open the three top clamp blocks [74].
- (o) Slowly lower the APU [71] on the cradle assembly [69] and base, SPL-1957, (transportation base) [70] until the three attach assemblies [76], [77] engage the three bottom clamp blocks [75].
- (p) Close the three top clamp blocks [74].
- (q) Tighten the three knobs [73].
- (r) Tighten the three jamnuts [72] on the three knobs [73].
- (s) Disconnect the two bow shackles [110] of the sling, SPL-1969, from the forward hoist bracket [42] and aft hoist bracket [41] on the APU.
- (t) Remove the APU [71], cradle assembly [69] and transportation base [70] from the area.

SUBTASK 49-11-00-210-010

- (4) Do a general visual inspection of the APU compartment:
  - (a) Do this task: Insulation Panel Inspection, TASK 49-17-11-200-801.
  - (b) Do this task: Air Inlet Seal Inspection, TASK 49-15-11-200-801.

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- (c) Visually examine the front area and inner surfaces of the exhaust duct muffler that you can get access from the APU compartment for cracks and damage.
  - 1) If you find cracks or damage on the exhaust duct muffler, do this task: Exhaust Duct Muffler Inspection, TASK 49-81-11-200-801.
- (d) Visually examine the inner surfaces of the seal depressor assembly [25] for damaged painted surfaces which include signs of paint peeling and missing paint.
  - 1) Signs of paint peeling and/or missing paint are permitted on the inner surfaces of the seal depressor assembly.
- (e) Visually examine the inner surfaces of the APU air inlet plenum that you can get access to from the APU compartment for cracks and damage.
  - 1) If you find cracks or damage on the APU air inlet plenum, do this task: APU AIR INLET PLENUM - REMOVAL/INSTALLATION, PAGEBLOCK 49-15-15/401.
- (f) Do this task: Eductor Inlet Duct Inspection, TASK 49-91-71-200-801.
- (g) Visually examine the bleed air duct for signs of oil and other contamination.
  - 1) If you find signs of oil and other contamination, then do these tasks:
    - a) Clean the bleed air duct. To clean it, do this task: Pneumatic Duct Cleaning, TASK 36-13-01-100-801.
    - b) Remove the oil contamination from the air conditioning and pneumatic systems. To remove it, do this task: Oil Contamination Removal from Air Conditioning and Pneumatic Systems, TASK 21-00-01-100-801.

SUBTASK 49-11-00-020-021

- (5) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

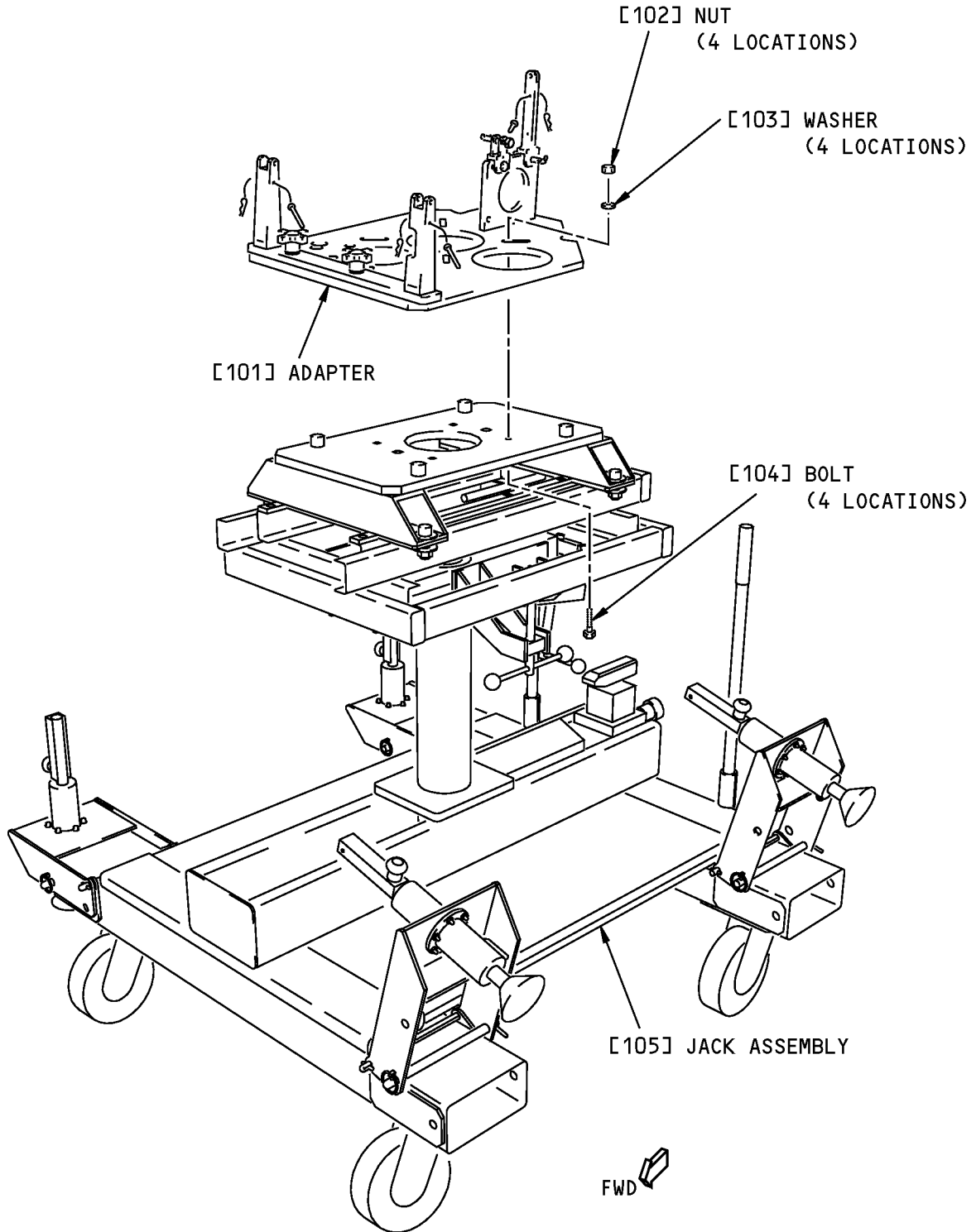
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**Auxiliary Power Unit (APU) Installation (Hydraulic Jack Procedure)  
Figure 402 (Sheet 1 of 12)/49-11-00-990-802**

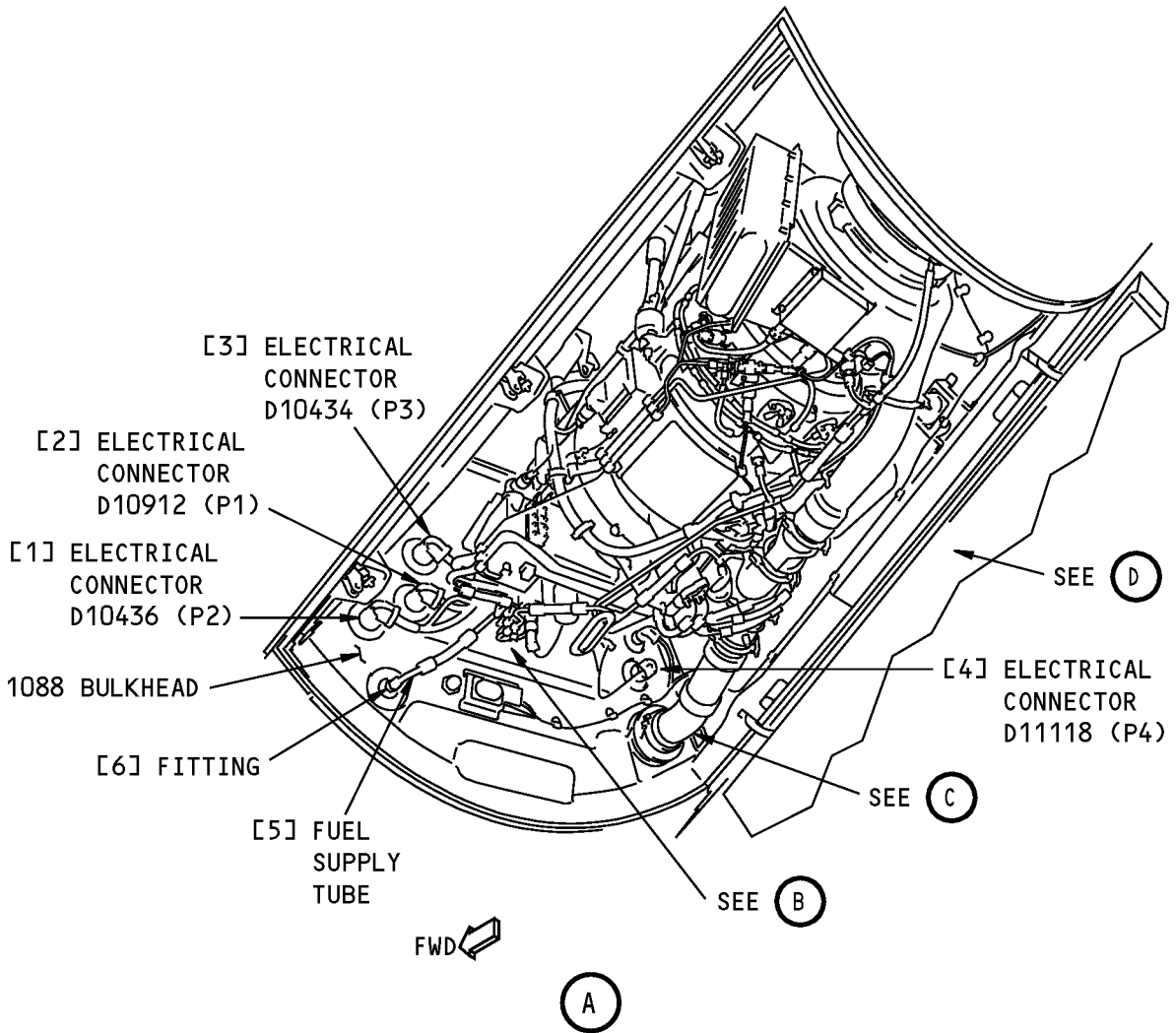
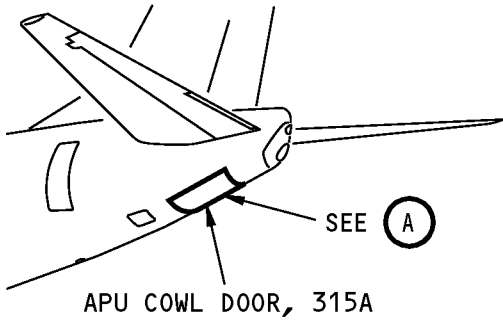
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**Auxiliary Power Unit (APU) Installation (Hydraulic Jack Procedure)  
Figure 402 (Sheet 2 of 12)/49-11-00-990-802**

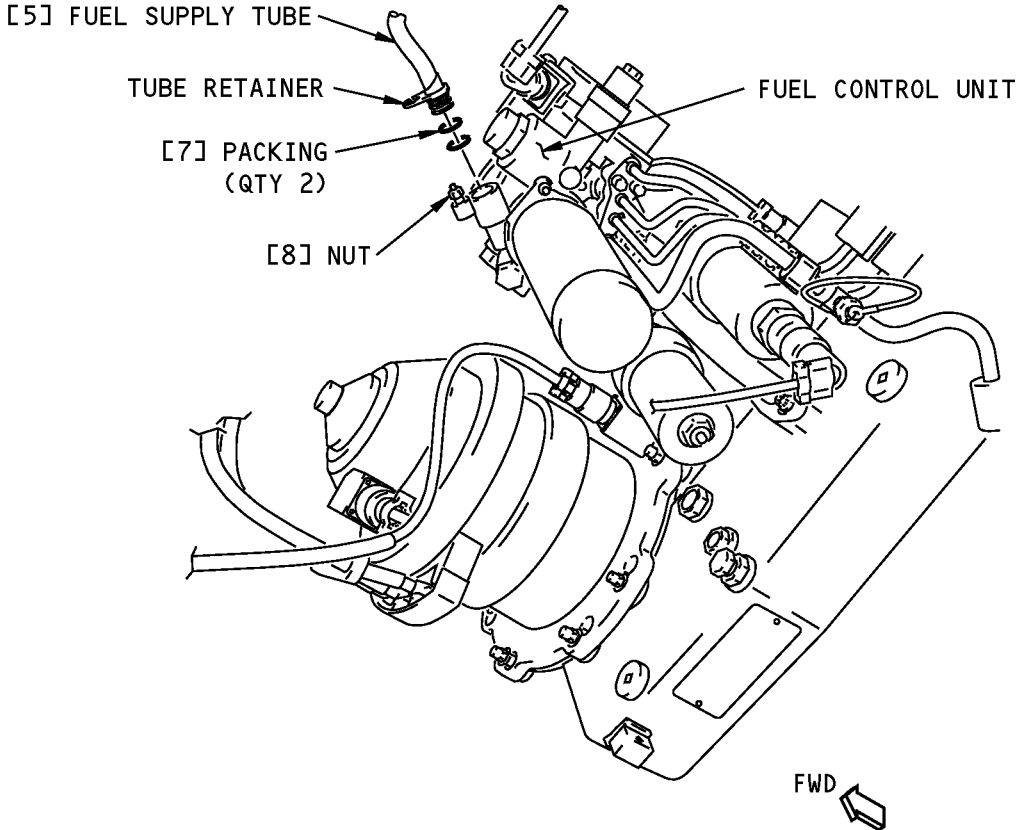
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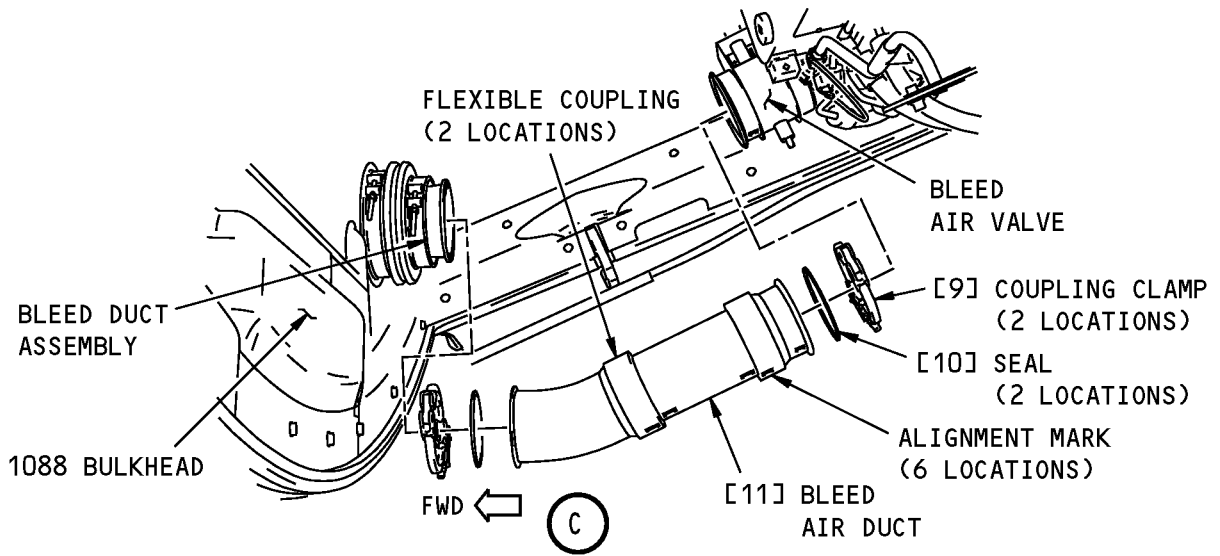
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**B**



**C**

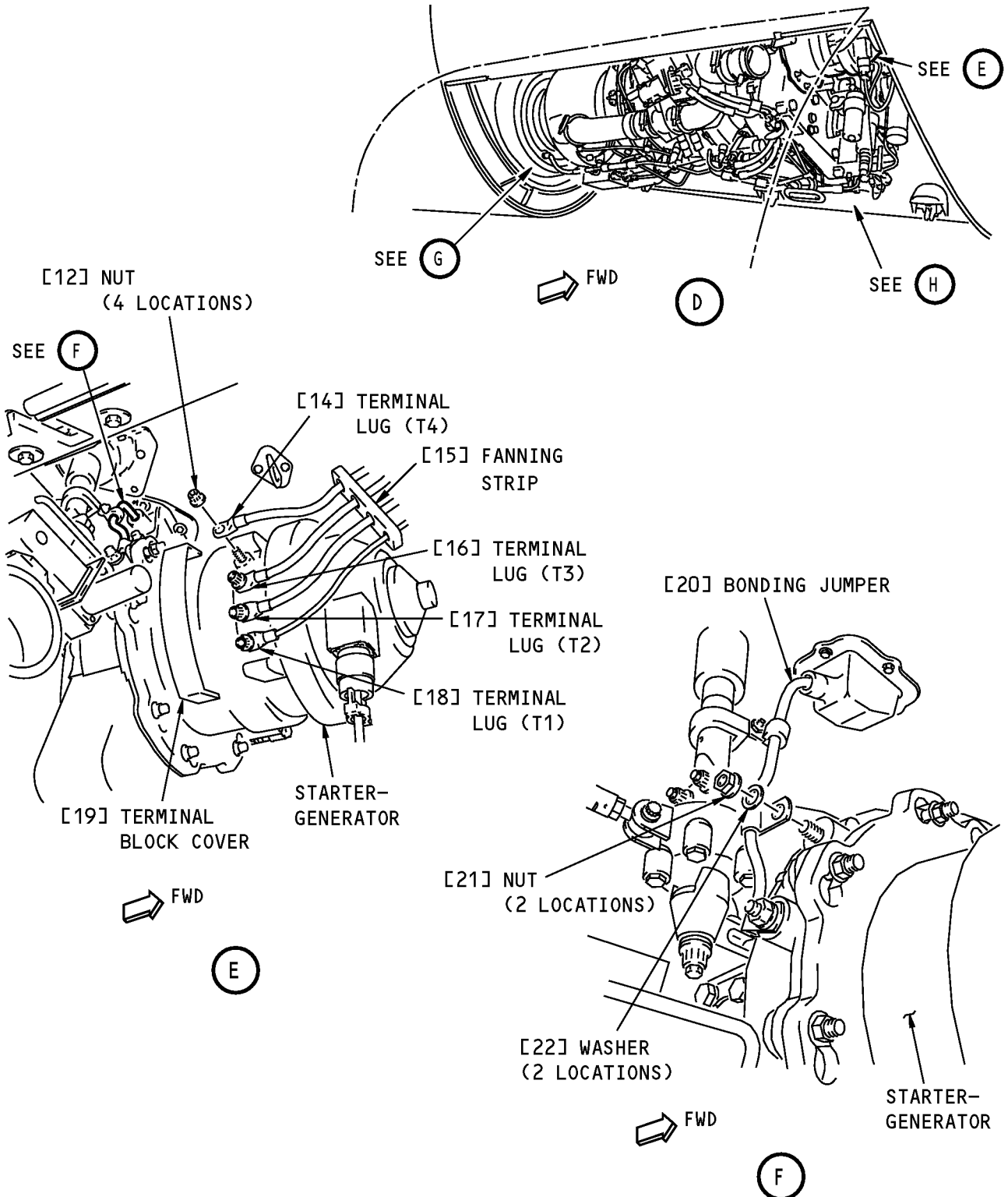
**Auxiliary Power Unit (APU) Installation (Hydraulic Jack Procedure)**  
**Figure 402 (Sheet 3 of 12)/49-11-00-990-802**

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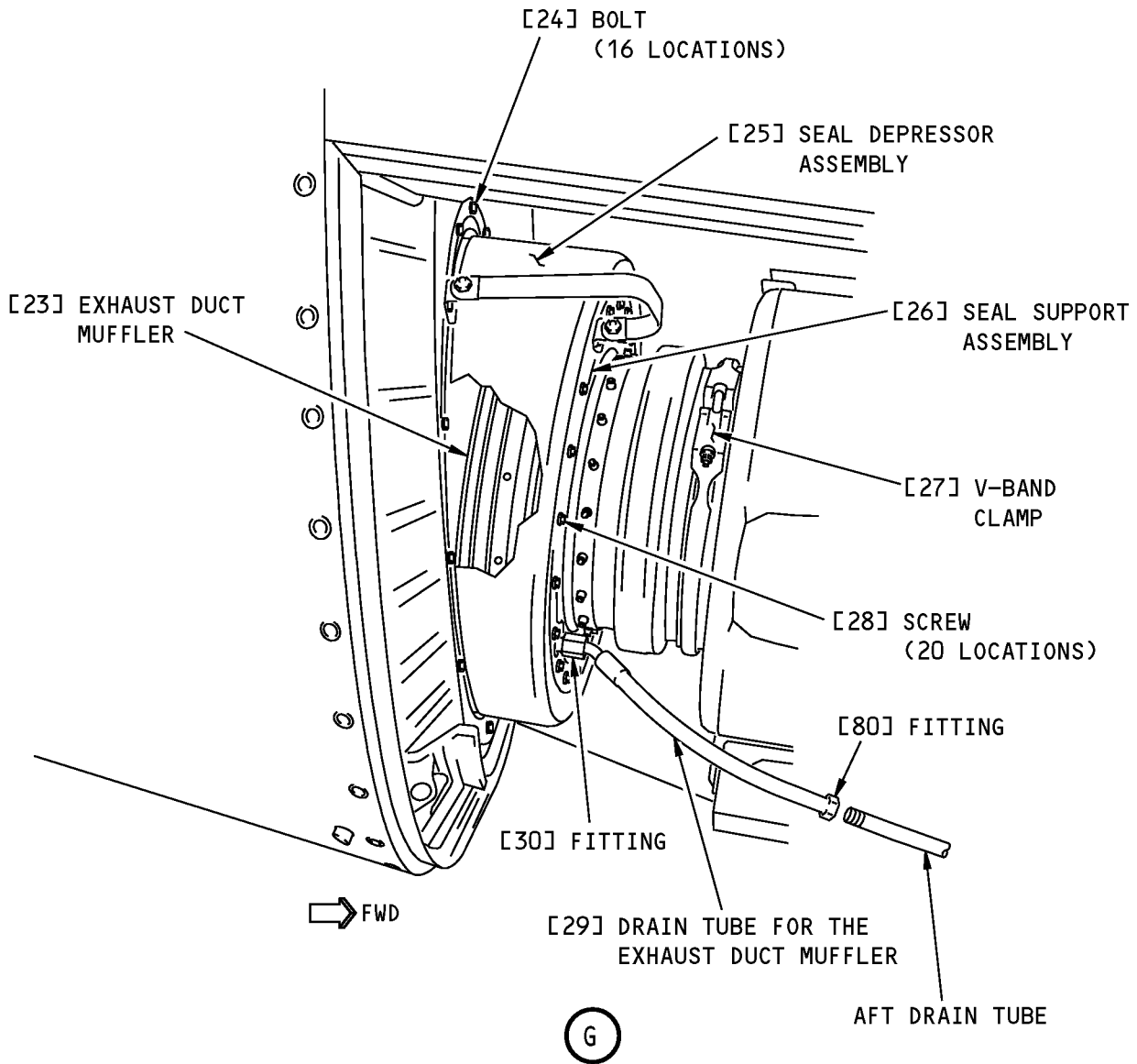
**Auxiliary Power Unit (APU) Installation (Hydraulic Jack Procedure)  
Figure 402 (Sheet 4 of 12)/49-11-00-990-802**

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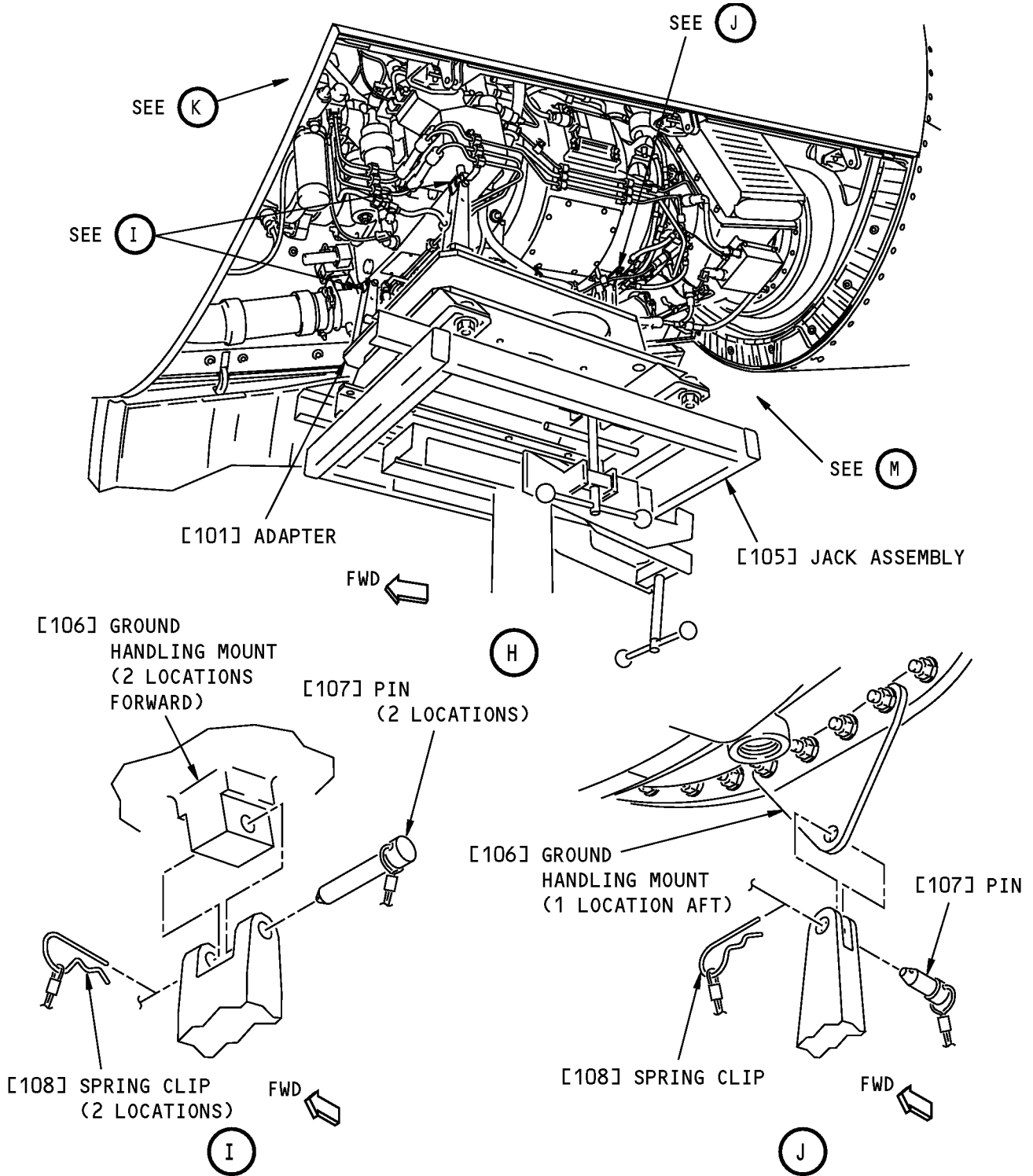
**Auxiliary Power Unit (APU) Installation (Hydraulic Jack Procedure)  
Figure 402 (Sheet 5 of 12)/49-11-00-990-802**

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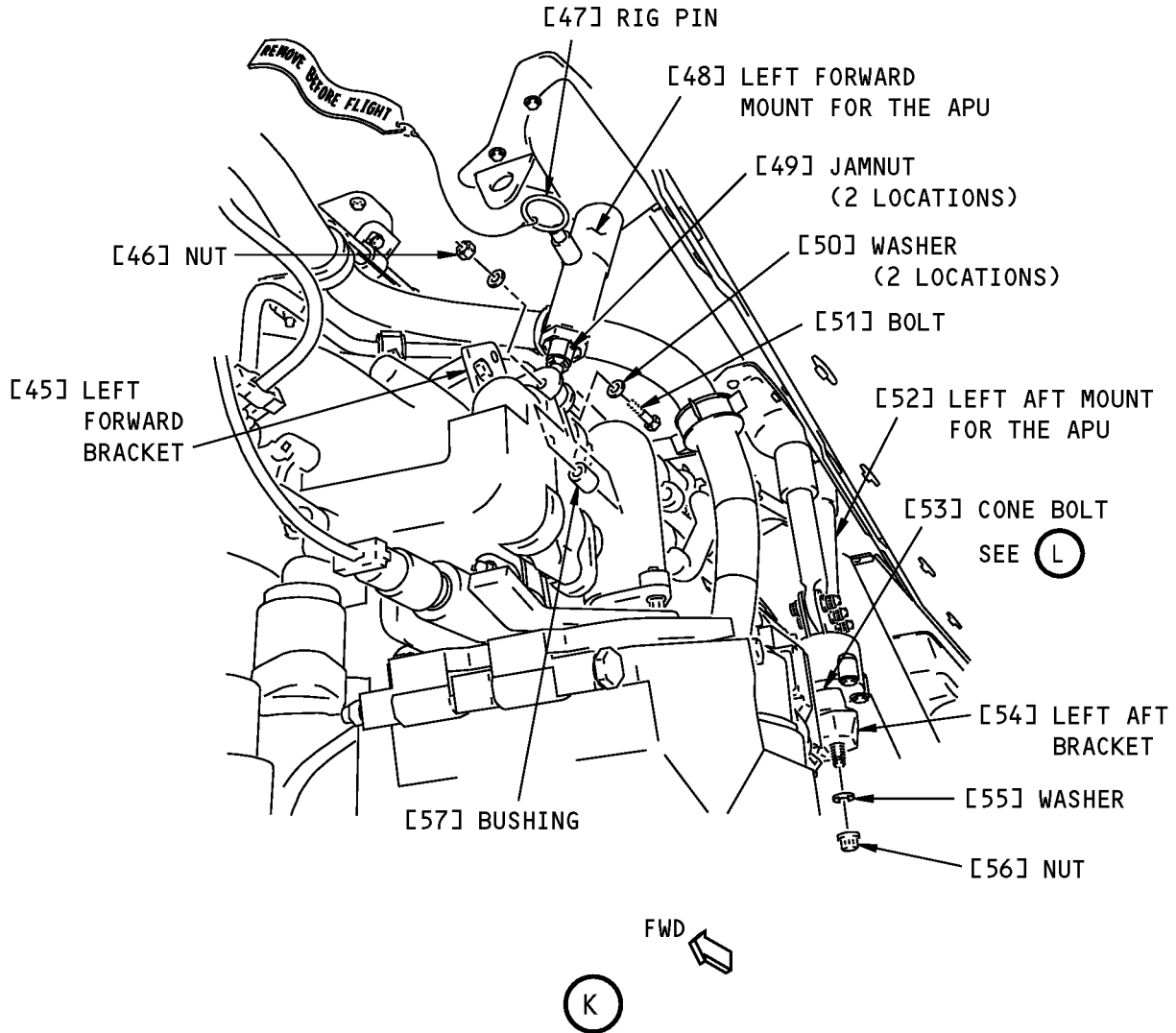
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**Auxiliary Power Unit (APU) Installation (Hydraulic Jack Procedure)**  
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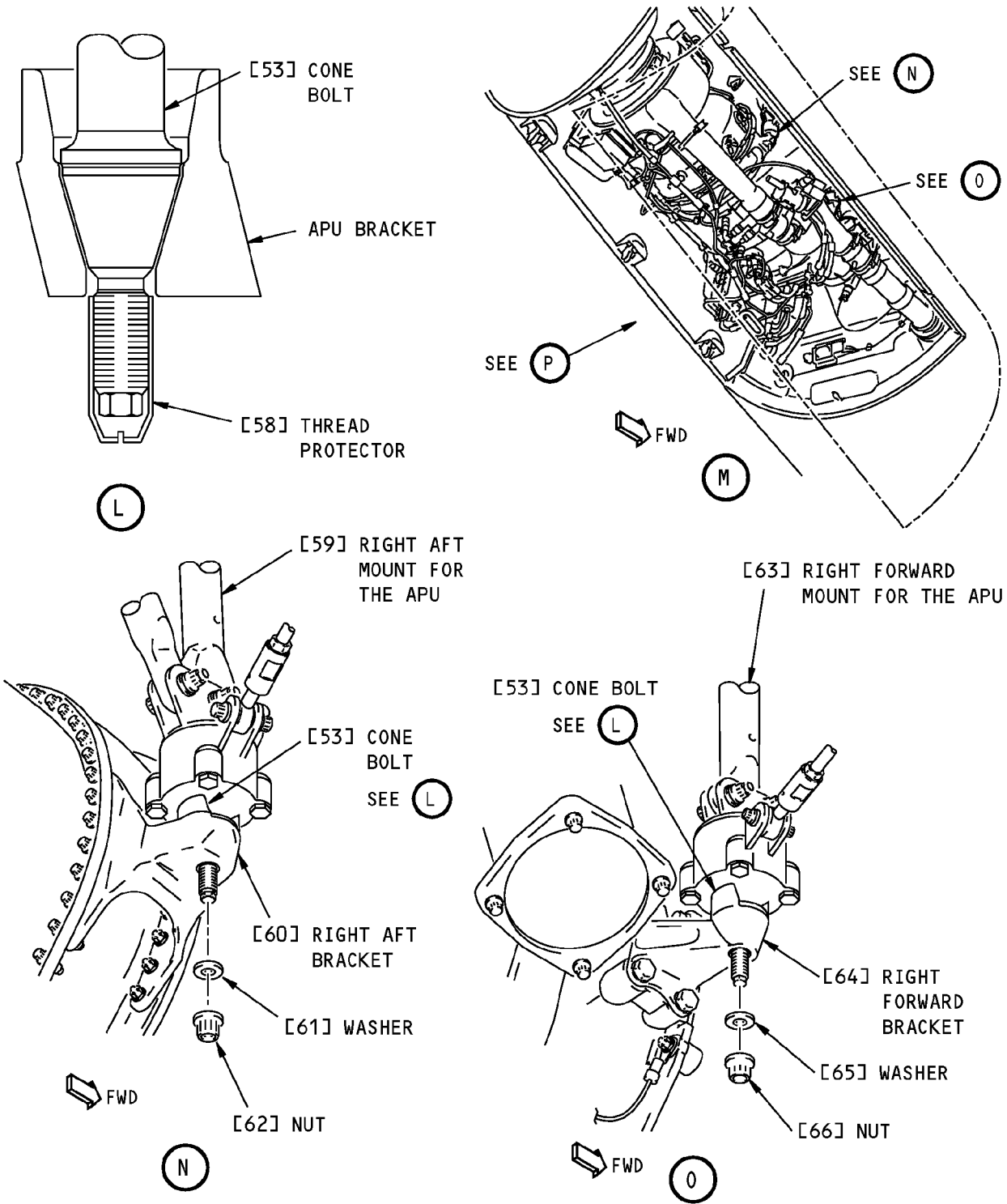
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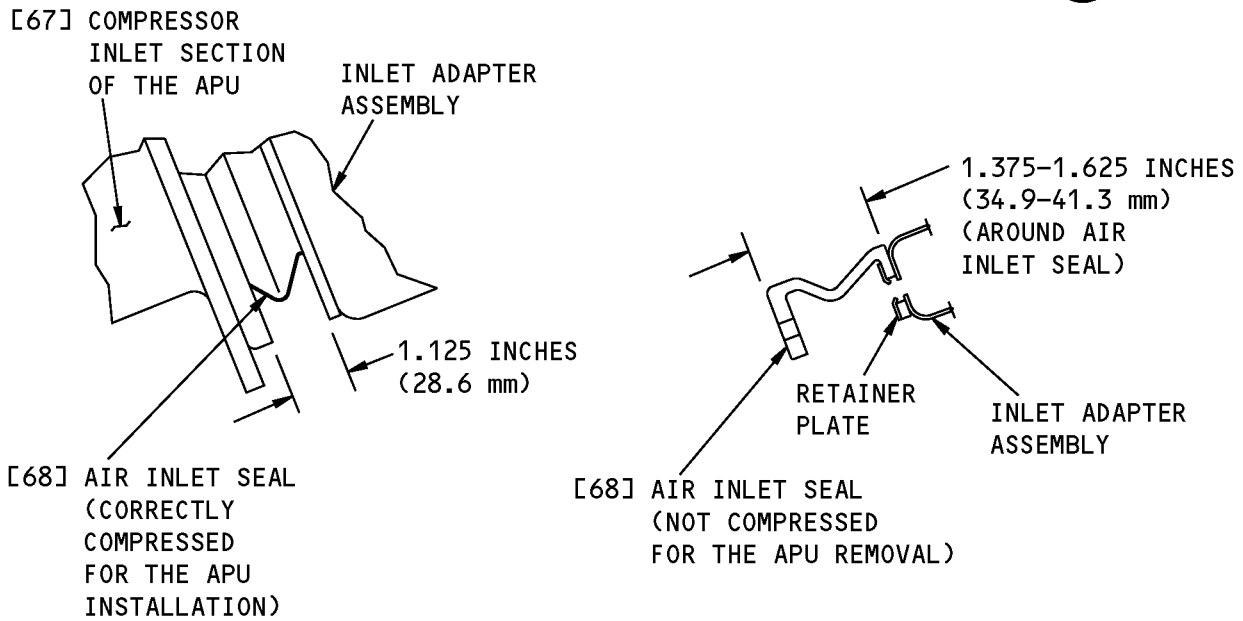
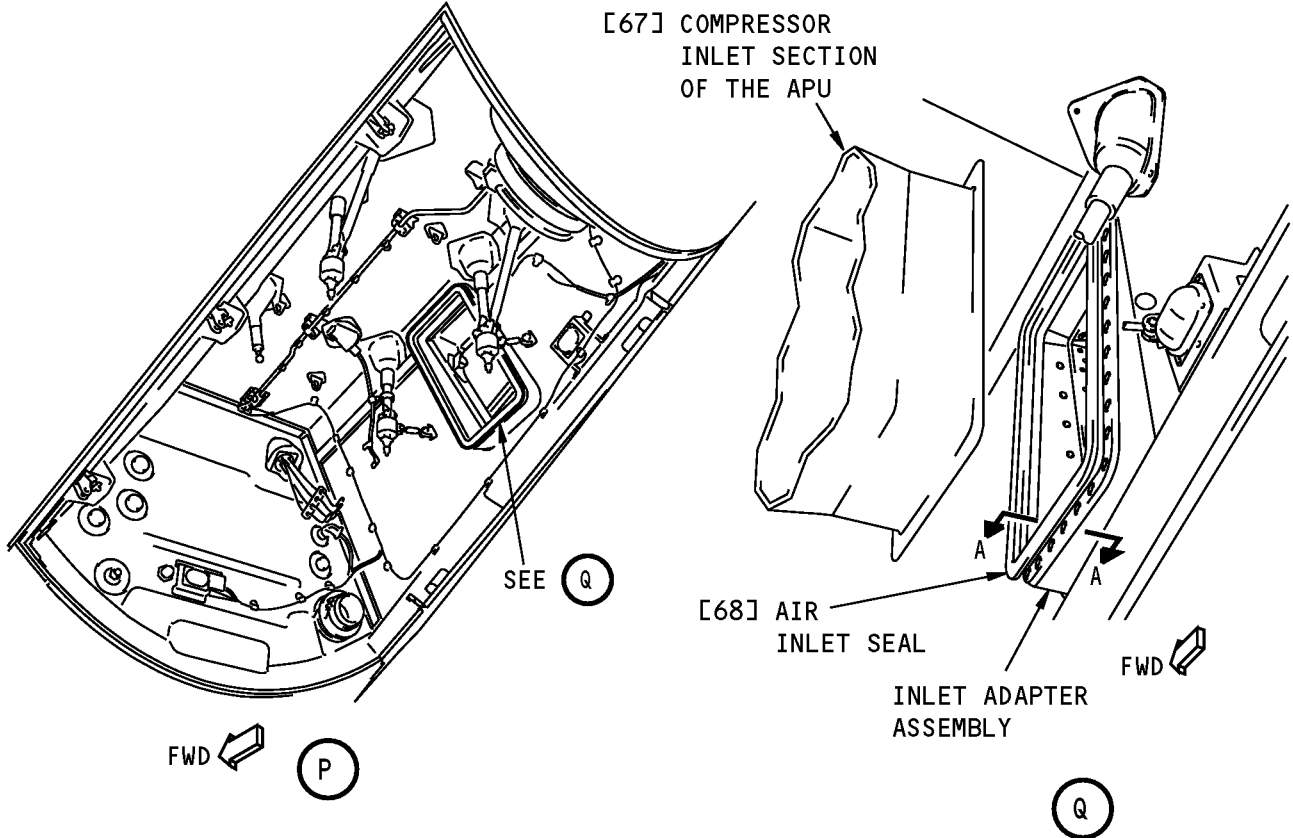


**Auxiliary Power Unit (APU) Installation (Hydraulic Jack Procedure)  
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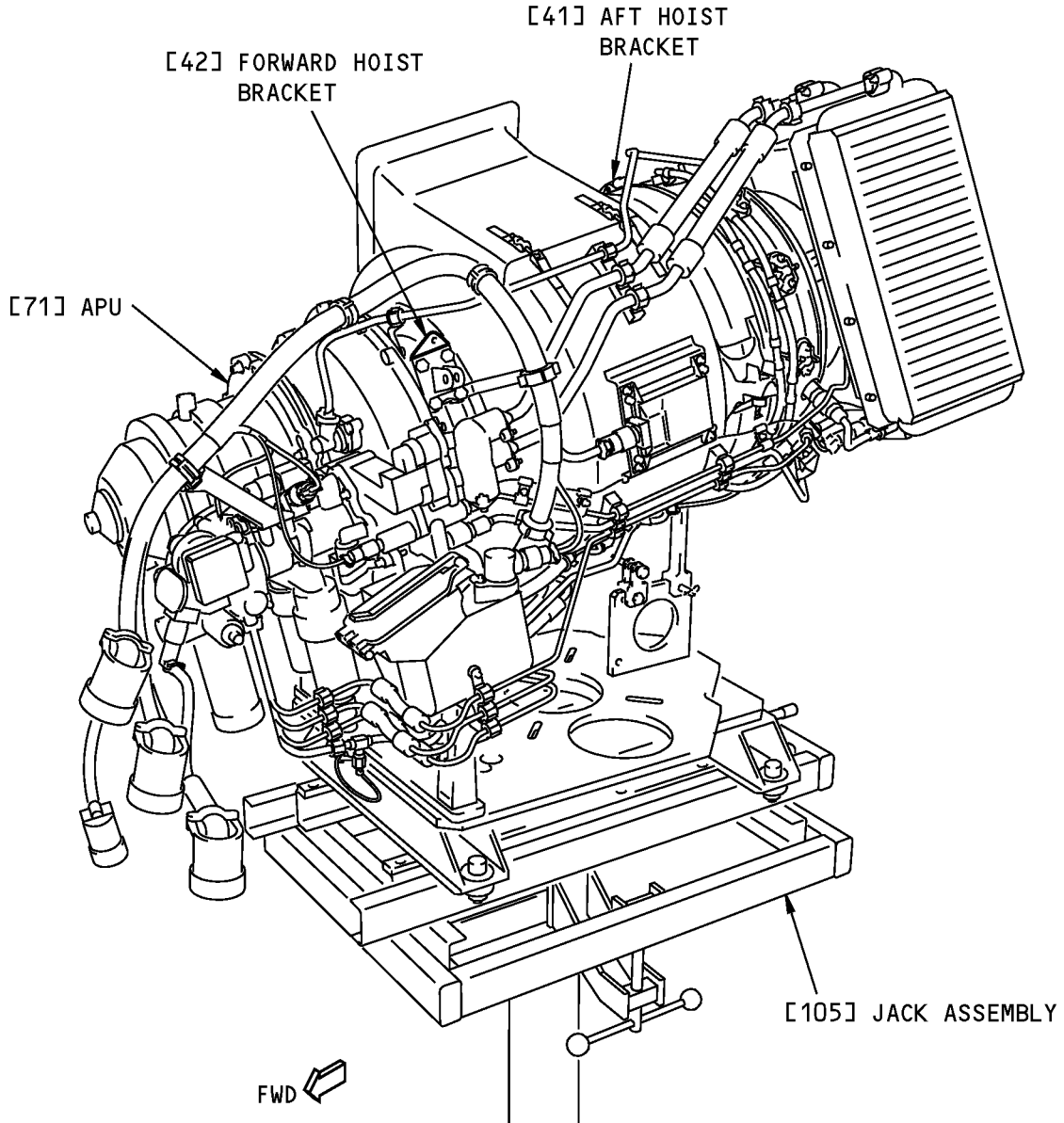


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**Auxiliary Power Unit (APU) Installation (Hydraulic Jack Procedure)**  
Figure 402 (Sheet 9 of 12)/49-11-00-990-802

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**Auxiliary Power Unit (APU) Installation (Hydraulic Jack Procedure)  
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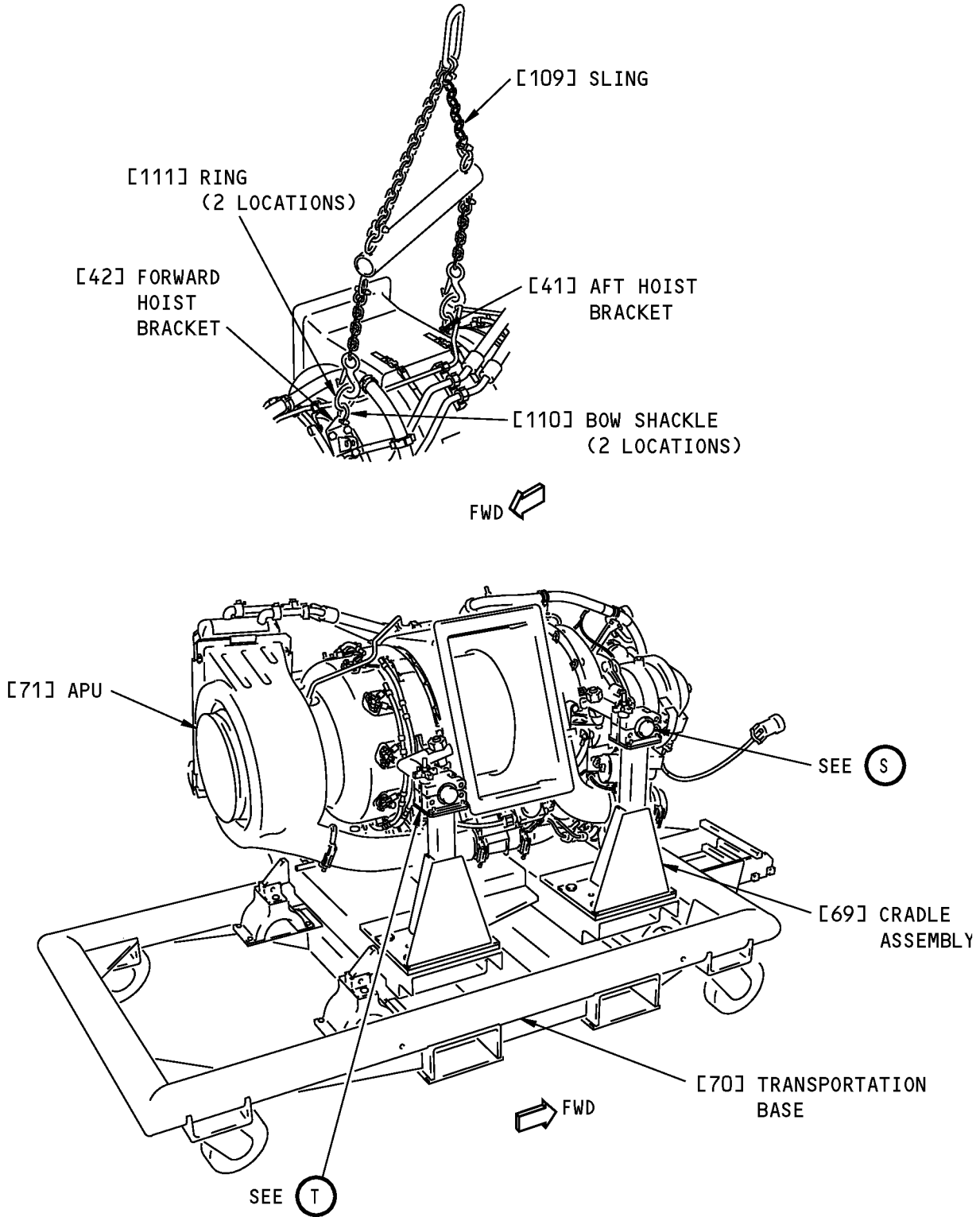
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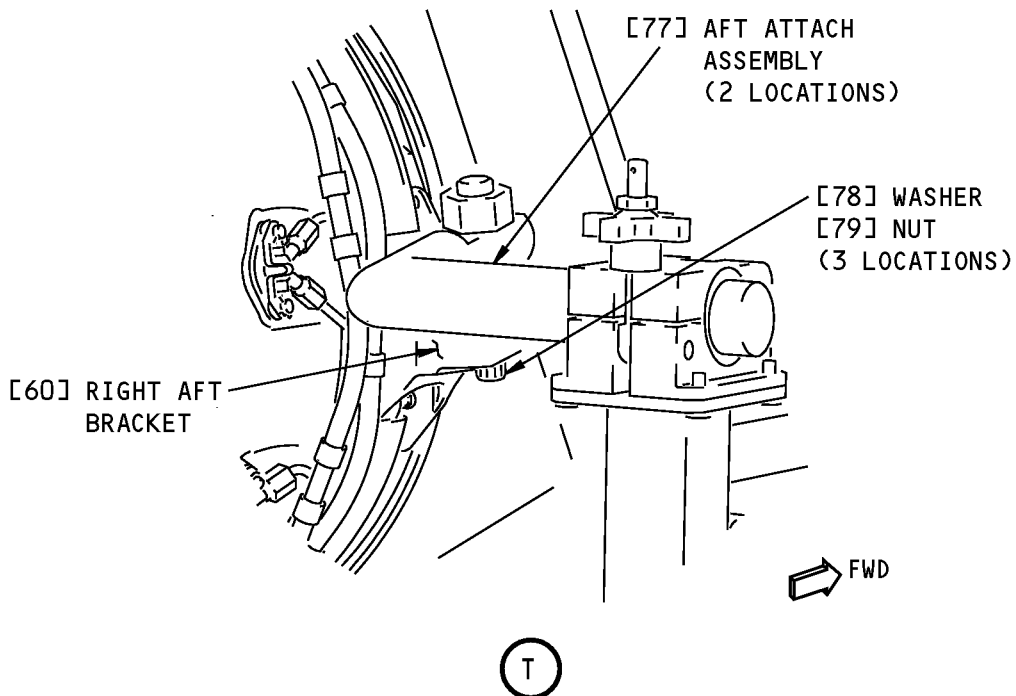
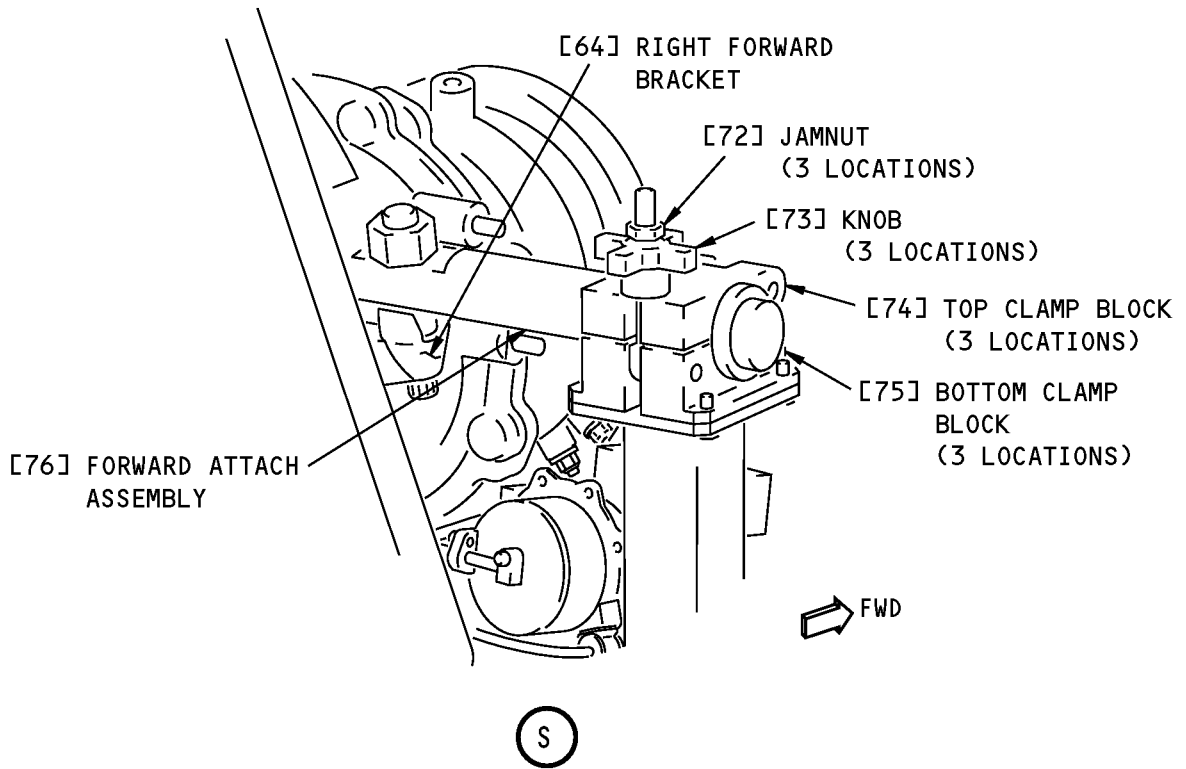
**Auxiliary Power Unit (APU) Installation (Hydraulic Jack Procedure)  
Figure 402 (Sheet 11 of 12)/49-11-00-990-802**

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**Auxiliary Power Unit (APU) Installation (Hydraulic Jack Procedure)  
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**TASK 49-11-00-400-803**

## 7. APU Power Plant Installation (Hydraulic Jack Procedure)

(Figure 402)

### A. General

(1) This procedure is a scheduled maintenance task.

### B. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-710-801	APU Operational Test (P/B 501)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-13-11-200-801	APU Mounts Inspection (APU Removed) (P/B 601)
49-17-11-200-801	Insulation Panel Inspection (P/B 601)
49-61-00-040-801	Low Oil Quantity BITE Deactivation (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
52-48-21-400-801	Auxiliary Power Unit (APU) Cowl Door Installation (P/B 401)

### C. Tools/Equipment

**NOTE:** When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Meter - Bonding (Approved Explosion Proof & Intrinsically Safe) (Part #: C15292 (MODEL T477W), Supplier: 01014, A/P Effectivity: 737-ALL) (Part #: M1, Supplier: 3AD17, A/P Effectivity: 737-ALL) (Part #: M1B, Supplier: 3AD17, A/P Effectivity: 737-ALL)
SPL-1561	Jack - Hydraulic (Part #: J20009-38, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Opt Part #: J20009-78, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-1957	Base - Transportation, APU (Part #: F72950-158, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-1969	Sling - Shop Handling, used with AlliedSignal AE131-9 APU (Part #: C49004-40, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-1970	Assembly - Cradle, AE131-9B APU (Part #: C49010-50, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-1971	Protector - Thread, APU Mount Bolt (Part #: C49006-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-1972	Equipment - Adapter, APU Jacking (Part #: C49008-37, Supplier: 81205, A/P Effectivity: 737-100, -200, -200C, -300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1064	Scraper - Phenolic, Hard Resin

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Reference	Description
STD-1208	Lever - Wood, 2 Inch by 4 Inch, 4-7 Feet Long
STD-1242	Hammer - Standard
STD-3906	Mallet - Rubber

#### D. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00130	Alcohol - Isopropyl	TT-I-735
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G01048	Lockwire - Corrosion Resistant Steel (0.032 In. Dia.)	NASM20995~ C32
G50222	Brush - Stiff Bristle, Non-Metalic - Tampico GA55-1	

#### E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Fuel supply tube	49-31-11-01-035	HAP 001-013, 015-026, 028-030
7	Packing	49-31-11-02-030 49-31-11-01-020	HAP 031-054, 101-999 HAP 001-013, 015-026, 028-030
10	Seal	49-31-11-02-015 49-52-11-01-010	HAP 031-054, 101-999 HAP 001-013, 015-026, 028-030
11	Bleed air duct	49-52-11-02-010 49-52-11-01-012	HAP 031-054, 101-999 HAP 001-013, 015-026, 028-030
29	Drain tube	49-52-11-02-015 49-91-21-01-035	HAP 031-054, 101-999 HAP 001-013, 015-026, 028-030
71	APU	49-91-21-02-025 49-11-00-01-075 49-11-00-02-085	HAP 031-054, 101-999 HAP 001-013, 015-026, 028-030 HAP 031-054, 101-999

#### F. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

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### G. Access Panels

Number	Name/Location
315A	APU Cowl Door

### H. Procedure

SUBTASK 49-11-00-210-007

- (1) Visually examine the four APU mounts [48], [52], [59], [63] for wear, cracks and damage.
  - (a) If you find wear, cracks or damage, do this task: APU Mounts Inspection (APU Removed), TASK 49-13-11-200-801.

SUBTASK 49-11-00-210-008

- (2) Visually examine the three ground handling mounts [106] on the APU for wear, cracks and damage.

SUBTASK 49-11-00-220-002

- (3) Measure the height of the air inlet seal [68] with the APU removed.

**NOTE:** The height from the bottom to the top of the air inlet seal [68] must be 1.375-1.625 inches (34.9-41.3 mm).

SUBTASK 49-11-00-420-012

- (4) If it is necessary, remove the protection covers from the compressor inlet section of the APU and the APU exhaust duct.

### I. Prepare for the Installation

SUBTASK 49-11-00-080-008

- (1) Do these steps to remove the APU [71] from the assembly, SPL-1970, (cradle assembly) [69] and base, SPL-1957, (transportation base) [70]:
  - (a) Make sure the APU [71], cradle assembly [69] and transportation base [70] is centered under the sling, SPL-1969, [109].
  - (b) Make sure the two rings [111] and two bow shackles [110] are attached to the sling, SPL-1969, [109].
  - (c) Attach the two bow shackles [110] of the sling, SPL-1969, to the forward hoist bracket [42] and aft hoist bracket [41] on the APU [71].
  - (d) Make sure the chains of the sling, SPL-1969, are tight to hold the weight of the APU [71].

**NOTE:** The weight of an APU [71] is approximately 410 pounds (186 kg).
  - (e) Loosen the three jamnuts [72] from the three knobs [73] on the cradle assembly [69].
  - (f) Loosen the three knobs [73] until the three top clamp blocks [74] disengage the three bottom clamp blocks [75].
  - (g) Open the three top clamp blocks [74].
  - (h) Remove the three nuts [79] and three washers [78] that attach the left aft bracket [54], right aft bracket [60] and right forward bracket [64] to the cradle assembly [69].
  - (i) Remove the forward attach assembly [76] from the right forward bracket [64].
  - (j) Remove the two aft attach assemblies [77] from the left aft bracket [54] and right aft bracket [60].
  - (k) Slowly lift the APU [71] from the cradle assembly [69].
  - (l) Close the three top clamp blocks [74].
  - (m) Tighten the three knobs [73].

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- (n) Tighten the three jamnuts [72] on the three knobs [73].
- (o) Remove the cradle assembly [69] and transportation base [70] from the area.

### J. Adapter and Hydraulic Jack Installation

SUBTASK 49-11-00-480-006

- (1) Do these steps to attach the APU [71] to the equipment, SPL-1972, (adapter) [101] and hydraulic jack, SPL-1561, (jack assembly) [105]:
  - (a) Position the adapter [101] on the jack assembly [105].
  - (b) Install the four bolts [104], four washers [103] and four nuts [102] that attach the adapter [101] to the hydraulic jack, SPL-1561, [105].
  - (c) Put the sling, SPL-1969, [109] and APU [71] above the adapter [101].
  - (d) Lower the APU [71] until the adapter [101] and the three ground handling mounts [106] are engaged.
  - (e) Install the three pins [107] that attach the adapter [101] to the three ground handling mounts [106] on the APU.
  - (f) Install the three spring clips [108] in the three pins [107].
  - (g) Disconnect the two bow shackles [110] of the sling, SPL-1969, from the forward hoist bracket [42] and aft hoist bracket [41] on the APU.
  - (h) Remove the sling, SPL-1969, [109] from the area.
  - (i) Put the APU [71] on the maintenance stand.

### K. APU Installation

SUBTASK 49-11-00-420-013

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Remove the protection covers from the compressor inlet section of the APU, APU exhaust duct and any other openings.

SUBTASK 49-11-00-420-014

- (2) Do these steps to install the APU [71] into the APU compartment:
  - (a) Make sure the APU [71] is directly under the APU compartment.
  - (b) Make sure the protector, SPL-1971, (thread protector) [58] are installed on the three cone bolts [53].
  - (c) Lift the APU [71] into position:
    - 1) Hold the left aft mount [52] and right aft mount [59] in position.

**CAUTION:** BE CAREFUL WHEN YOU MOVE THE APU IN THE APU COMPARTMENT. YOU MUST TILT THE APU APPROXIMATELY 10-15° IN THE FORWARD-END-DOWN POSITION WHILE THE APU IS IN THE APU COMPARTMENT. DAMAGE TO THE FUEL SUPPLY LINE, STARTER-GENERATOR WIRE HARNESS AND ENGINE WIRE HARNESS CAN OCCUR.

- 2) Tilt the APU [71] so that the forward end of the APU is lower than the aft end.

**NOTE:** When the APU [71] is installed, it is in the 11° forward-end-down position.

- 3) Slowly lift the APU [71] until the left aft bracket [54], right aft bracket [60] and right forward bracket [64] are below the three cone bolts [53].

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- 4) Make sure the left aft mount [52], right aft mount [59] and right forward mount [63] are engaged at the same time.

**CAUTION:** CAREFULLY LIFT THE APU SO THAT YOU DO NOT DAMAGE THE CONED SURFACES OF THE APU MOUNTS.

- 5) Lift the APU [71] until the three cone bolts [53] are engaged.
- 6) Lift the APU [71] until the air inlet seal [68] is fully engaged with the compressor inlet section of the APU [67].

**NOTE:** The compressed area of the air inlet seal [68] must show no signs of buckling or caught on the edge of the compressor inlet section of the APU.

- 7) Measure the height of the compressed area of the air inlet seal [68] with the APU installed.

**NOTE:** The height from the bottom to the top of the air inlet seal (between the inlet adapter assembly and the APU) must be less than 1.125 inches (28.6 mm).

- (d) Connect the APU [71] to the left aft mount [52], right aft mount [59] and right forward mount [63]:
  - 1) Remove the protector, SPL-1971, (thread protector) [58] from the three cone bolts [53].
  - 2) Apply the Never-Seez NSBT-8N compound, D00006, to the threads of the three cone bolts [53].
  - 3) Install the three washers [55], [61], [65] and three nuts [56], [62], [66] on the three cone bolts [53].
  - 4) Do the torque limit test for the three nuts [56], [62], [66]:
    - a) Tighten the three nuts to a run-on torque of not more than 100 inch-pounds (11.3 newton-meters).
    - b) Stop when a minimum of one full thread and the cone bolt chamfer extends below each nut (but not before the washer touches the APU mount).
    - c) Make sure the break-away torque necessary to turn the three nuts from this position is more than 14 inch-pounds (1.6 newton-meters).
    - d) Replace the nut(s) that do not meet these torque limits.
    - e) If the nut(s) were replaced, do the torque limit test again for the new nut(s).
  - 5) Tighten the three nuts [56], [62], [66] to 375-425 inch-pounds (42.4-48.0 newton-meters).
- (e) Connect the APU [71] to the left forward mount [48]:
  - 1) Remove the nut [46], two washers [50] and bolt [51] from the left forward mount [48].
  - 2) Make sure the bushing [57] is installed in the left forward mount [48].
  - 3) Install the rig pin [47] in the left forward mount [48].

**NOTE:** The rig pin is a component of the protector, SPL-1971.
  - 4) Align the holes of the left forward bracket [45] to the left forward mount [48].
  - 5) If the holes of the left forward bracket [45] and the left forward mount [48] do not align, adjust the left forward mount:
    - a) Remove the lockwire, G01048, from the bottom jamnut [49] on the left forward mount [48].

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- b) Turn the bottom jamnut [49] clockwise or counterclockwise until the holes of the left forward bracket [45] align with the left forward mount [48].

NOTE: One full turn of the jamnut will extend or retract the left forward mount a distance of 0.04 inch (1 mm).

- c) Make sure that you can see a minimum of one full thread from the bottom jamnut [49].
- d) If more adjustments are necessary, remove the seven screws and seven washers that attach the firewall cover to the top insulation panel.
- e) Move the firewall cover down until you can get access to the top jamnut [49].
- f) Remove the lockwire, G01048, from the top jamnut [49] on the left forward mount [48].
- g) Turn the top jamnut [49] clockwise or counterclockwise until the holes of the left forward bracket [45] align with the left forward mount [48].

NOTE: One full turn of the jamnut will extend or retract the left forward mount a distance of 0.04 inch (1 mm).

- h) Make sure that you can see a minimum of one full thread from the top jamnut [49].
- i) Tighten the jamnut(s) [49].
- j) Install the lockwire, G01048, on the jamnut(s) [49].
- k) Remove the remaining sealant from the surface of the firewall cover and the top insulation panel with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
- l) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
- m) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.

NOTE: It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

- n) Install the firewall cover to the top insulation panel with the seven washers and seven screws.
- o) Apply a fillet seal of sealant, A00160, around the firewall cover.
- p) Remove the unwanted sealant from the firewall cover and the top insulation panel with a cotton wiper, G00034.

NOTE: It is not necessary for the sealant to dry.

- 6) Install the bolt [51], two washers [50] and nut [46].
- 7) Remove the rig pin [47] from the left forward mount [48].

### L. Adapter and Hydraulic Jack Removal

SUBTASK 49-11-00-080-003

- (1) Do these steps to remove the equipment, SPL-1972, (adapter) [101] from the APU:
  - (a) Remove the three spring clips [108] from the three pins [107].
  - (b) Remove the three pins [107] that attach the adapter [101] to the three ground handling mounts [106].
  - (c) Use the hydraulic jack, SPL-1561, (jack assembly) [105] to slowly lower the adapter [101] out of the APU compartment.

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SUBTASK 49-11-00-080-004

- (2) Do these steps to remove the equipment, SPL-1972, (adapter) [101] from the hydraulic jack, SPL-1561, (jack assembly) [105]:
  - (a) Move the adapter [101] and the jack assembly [105] away from the APU compartment.
  - (b) Remove the four nuts [102], four washers [103] and four bolts [104] that attach the adapter [101] to the jack assembly [105].
  - (c) Remove the adapter [101].

### M. APU Connections

SUBTASK 49-11-00-420-015

- (1) Do these steps to connect the exhaust duct muffler [23]:
  - (a) Make sure the exhaust duct muffler [23] touches the APU.
    - 1) Pull the exhaust duct muffler [23] forward to the APU until the exhaust duct muffler touches the APU.
    - 2) If it is necessary, use a 2 inch by 4 inch, 4-7 feet long wood lever, STD-1208, and standard hammer, STD-1242, to lightly tap the exhaust duct muffler [23] forward to the APU until the exhaust duct muffler touches the APU.
  - (b) If the exhaust duct muffler [23] does not touch the APU or the flanges are not aligned, do these steps to make sure the exhaust duct muffler touches the APU:
    - 1) Loosen the 16 bolts [24] that attach the seal depressor assembly [25] to the 1156 bulkhead.
    - 2) Move the exhaust duct muffler [23] until the exhaust duct muffler touches the APU.
    - 3) If more adjustments are necessary, loosen the 20 screws [28] that attach the seal support assembly [26] to the exhaust duct muffler [23].
    - 4) Move the exhaust duct muffler [23] until the exhaust duct muffler touches the APU and the flanges are aligned.
  - (c) Install the V-band clamp [27] on the exhaust duct muffler [23]:
    - 1) Put the V-band clamp [27] on the exhaust duct muffler [23].
    - 2) Tighten the V-band clamp [27] to 70-90 inch-pounds (7.9-10.2 newton-meters).
    - 3) Lightly hit the edge of the V-band clamp [27] with a rubber mallet, STD-3906.
    - 4) Continue to tighten and hit the V-band clamp [27] until the torque value stays constant.
  - (d) If the 20 screws [28] were loosened during the adjustment of the exhaust duct muffler [23], tighten the 20 screws on the seal support assembly [26].
  - (e) If the 16 bolts [24] were loosened during the adjustment of the exhaust duct muffler [23], tighten the 16 bolts on the seal depressor assembly [25].

SUBTASK 49-11-00-420-016

- (2) Do these steps to install the drain tube [29] for the exhaust duct muffler:
  - (a) Remove the caps or plugs from the drain tube [29], fitting [30] on the exhaust duct muffler and fitting [80] on the aft drain tube of the APU.
  - (b) Apply a thin layer of Never-Seez NSBT-8N compound, D00006, on the threads of the fitting [30] and fitting [80].
  - (c) Connect the drain tube [29] to the fitting [80] on the aft drain tube of the APU.
  - (d) Connect the drain tube [29] to the fitting [30] on the exhaust duct muffler.
  - (e) Tighten the two ends of the drain tube [29] to 230 inch-pounds (26 newton-meters).

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SUBTASK 49-11-00-420-017

- (3) Do these steps to connect the bonding jumper [20]:
- Clean the surfaces of the two studs:
    - Apply alcohol, B00130, to a Tamico GA55-1 brush, G50222, or cotton wiper, G00034.
    - Use a small amount of pressure on the Tamico GA55-1 brush, G50222, or cotton wiper, G00034, while you clean the surfaces of the two studs.
    - Continue to clean the surfaces until there are no visible residue on the surfaces.
  - Connect the bonding jumper [20] to the two studs with the two washers [22] and two nuts [21]:
    - Tighten the two nuts [21].
    - Use an bonding meter, COM-1550, to make sure the bonding resistance between the APU and the airplane structure is 0.0025 ohm or less.

SUBTASK 49-11-00-420-018

- (4) Do these steps to connect the four terminal lugs [14], [16], [17], [18]:
- Disengage the terminal block cover [19] from the four pins on the starter-generator.
  - Remove the terminal block cover [19].
  - Remove the four nuts [12] from the four terminal studs.
  - Connect the four terminal lugs (T1) [18], (T2) [17], (T3) [16] and (T4) [14] to the related terminal studs.

**NOTE:** The terminal strip and the fanning strip [15] show the identification of the terminal studs for each of the terminal lugs (T1), (T2), (T3) and (T4).

- Install the four nuts [12] on the four terminal studs.
  - Tighten the four nuts [12] to 115-135 inch-pounds (13.0-15.2 newton-meters).
- Put the terminal block cover [19] on the starter-generator.
- Engage the terminal block cover [19] to the four pins on the starter-generator.

SUBTASK 49-11-00-420-019

- (5) Do these steps to install the bleed air duct [11]:
- Install the two seals [10] on the bleed air duct [11].
  - Put the two coupling clamps [9] on the bleed air valve and bleed duct assembly.

**NOTE:** The bleed duct assembly extends through the 1088 bulkhead.

- Put the bleed air duct [11] in its position.

**NOTE:** To install the bleed air duct [11], make sure the directional flow arrow points away from the front of the APU.

- Open the two coupling clamps [9] to permit the two alignment marks on the bleed air duct [11] to align with the alignment mark on the bleed air valve and the bleed duct assembly.
- Make sure the alignment marks on the two flexible couplings align with the two alignment marks on the bleed air duct [11].
- Make sure the center of the alignment mark on the bleed air duct [11] is  $\pm 0.16$  inch (4 mm) from the center of the alignment mark on the bleed air valve.
- Put the two coupling clamps [9] over the flanges of the bleed air valve, bleed air duct [11] and bleed duct assembly.

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1) Tighten the two coupling clamps [9] to 95-110 inch-pounds (10.6-12.4 newton-meters).

SUBTASK 49-11-00-420-020

- (6) Do these steps to install the fuel supply tube [5]:
  - (a) Remove the caps or plugs from the fuel supply tube [5], fitting [6] and fuel control unit.
  - (b) Lubricate the two new packings [7] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
  - (c) Install the two packings [7] on the fuel supply tube [5].
  - (d) Connect the fuel supply tube [5] to the fuel control unit.
  - (e) Turn the tube retainer on the fuel supply tube [5] clockwise until the flange fully engages the stud.
  - (f) Tighten the nut [8] to 40 inch-pounds (4.5 newton-meters).
  - (g) Apply a thin layer of aircraft turbine engine oil, D50055, on the threads of the fitting [6].
  - (h) Connect the fuel supply tube [5] to the fitting [6] on the 1088 bulkhead.

SUBTASK 49-11-00-420-021

- (7) Do these steps to connect the four electrical connectors [1], [2], [3], [4] to the APU firewall receptacles on the 1088 bulkhead:
  - (a) Remove the caps from the electrical connectors.
  - (b) Connect the electrical connector D11118 (P4) [4].
  - (c) Connect the electrical connector D10434 (P3) [3].
  - (d) Connect the electrical connector D10912 (P1) [2].
  - (e) Connect the electrical connector D10436 (P2) [1].

#### N. APU Installation Test

SUBTASK 49-11-00-410-003

- (1) If the APU Cowl Door, 315A was removed, do this task: Auxiliary Power Unit (APU) Cowl Door Installation, TASK 52-48-21-400-801.

**NOTE:** Do not close the APU Cowl Door, 315A at this time. Use the two hold-open rods to hold the APU Cowl Door, 315A open.

SUBTASK 49-11-00-210-011

- (2) Do a general visual inspection of the seven insulation panels:
  - (a) Visually examine the seven insulation panels that you can get access from the APU compartment for holes, tears, separation and damage.
  - (b) If you find holes, tears, separation or damage on the insulation panels, do this task: Insulation Panel Inspection, TASK 49-17-11-200-801.

SUBTASK 49-11-00-860-012

- (3) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-11-00-860-013

- (4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-11-00-710-002

- (5) Do the installation test for the APU:
  - (a) Do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.
  - (b) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (c) During the APU operation, examine the APU for signs of oil and fuel leakage.
 

**NOTE:** A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted during an APU operation from the forward drain on the APU drain seal.
  - (d) If you find oil leakage or more than the fuel leakage rate, do these steps to repair the leakage:
    - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
    - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
    - 3) Repair the cause of the fuel or oil leakage.
    - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
    - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
    - 6) During the APU operation, examine the APU for signs of oil and fuel leakage.
    - 7) If you find oil leakage or more than the fuel leakage rate, do the leakage repair again.
  - (e) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
    - 1) If maintenance message(s) show for the APU, refer to the applicable Maintenance Message Index in the FIM.
    - 2) Look at the IDENT/CONFIG page on the control display unit (CDU) display for the APU HOURS.
    - 3) If it is necessary to set the APU HOURS to 0.0, then do these steps:
      - a) Push the line select key 6R adjacent to RESET HOURS SINCE INSTALLATION > .
 

**NOTE:** The DO YOU WANT TO RESET THE HOURS SINCE INSTALLATION ON THIS AIRPLANE? shows on the CDU display.
      - b) Push the line select key 5R adjacent to YES > .
 

**NOTE:** You push the line select key 2R adjacent to NO > if it is not necessary to set the APU HOURS to 0.0 or to go back to the IDENT/CONFIG page.
    - 4) If you have installed a new APU and prefer the LOQ BITE to be deactivated, do this task: Low Oil Quantity BITE Deactivation, TASK 49-61-00-040-801.
  - (f) Do this task: APU Operational Test, TASK 49-11-00-710-801.

O. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-00-410-004

- (1) Close this access door. To close this access door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.

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- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

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**APU POWER PLANT - ADJUSTMENT/TEST**

**1. General**

A. This procedure has the task to do the APU operational test.

**TASK 49-11-00-710-801**

**2. APU Operational Test**

(Figure 501)

A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
220	Subzone - Passenger Compartment - Body Station 259.50 to 360.00
240	Subzone - Passenger Compartment - Body Station 663.75 to Body Station 1016.00

C. Procedure

**HAP 101-999**

SUBTASK 49-11-00-860-001

(1) Do the APU operational test:

- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (b) Operate the APU with no load for a minimum of five minutes.

**NOTE:** For extended APU service life, it is recommended that you operate the APU for two minutes before you apply a pneumatic load. You can apply an electrical load when the APU GEN OFF BUS light comes on.

- (c) Make sure the BUS TRANS switch [11] on the P5 forward overhead panel is in the AUTO position.
- (d) Make sure the APU GEN OFF BUS light [10] comes on.
- (e) Set the AC selector switch [2] to the APU GEN position.
- (f) Look at the CPS FREQ display [1].

**NOTE:** With no load applied to the APU, the CPS FREQ display must become stable at 395 - 405 CPS.

- (g) Set the two APU GEN switches [9] to the ON position and then release.

**NOTE:** One of the two APU GEN switches will connect the APU starter-generator to the two 115V ac transfer busses.

- (h) Make sure the APU GEN OFF BUS light [10] goes off.

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### HAP 101-999 (Continued)

- (i) Put an electrical load of 60 amps on the APU starter-generator.

NOTE: The APU exhaust gas temperature (EGT) indicator on the P5 forward overhead panel can spike (move) quickly to half scale (400°C - 500°C) when you put an electrical load on the APU starter-generator and then move down to zero after a few bounces. This APU condition is satisfactory.

- (j) Set these switches on the P5 forward overhead panel:

- 1) Set the ISOLATION VALVE switch [6] to the OPEN position.
- 2) Make sure the engine 1 BLEED switch [12] and engine 2 BLEED switch [7] are in the OFF position.
- 3) Make sure the L PACK switch [4] and R PACK switch [5] are in the OFF position.
- 4) Set the APU BLEED switch [8] to the ON position.
- 5) Set the two switches [3] for the cabin temperature control to the AUTO NORMAL position.
- 6) Set the L PACK switch [4] and R PACK switch [5] to the AUTO position.

NOTE: It is recommended that you operate the APU with the two air conditioning packs when maximum cabin cooling is necessary. Use the two air conditioning packs as an alternative to the one air conditioning pack operation. The results of the operation of two air conditioning packs will be cooler cabin temperatures, lower APU fuel burn, better APU hot section life and lower APU noise. Refer to Service Letter 737-SL-49-060 for more data on these results.

- (k) Let the APU exhaust gas temperature (EGT) become stable (one to two minutes).
- (l) Set the L PACK switch [4] and R PACK switch [5] to the HIGH position.
- (m) Let the APU exhaust gas temperature (EGT) become stable (one to two minutes).
- (n) Look at the CPS FREQ display [1].

NOTE: With the APU fully loaded, the CPS FREQ display must become stable at 395 - 405 CPS. A small change in the APU starter-generator frequency (2 - 4 CPS) and the bleed duct pressure (1 - 2 psi) are permitted for the fully loaded condition.

- (o) Set these switches on the P5 forward overhead panel to remove the pneumatic load:
- 1) Set the L PACK switch [4] and R PACK switch [5] to the OFF position.
  - 2) Set the two switches [3] for the cabin temperature control to the OFF MANUAL position.
  - 3) Set the APU BLEED switch [8] to the OFF position.
  - 4) Set the ISOLATION VALVE switch [6] to the CLOSE position.
- (p) Remove the electrical load from the APU starter-generator.
- (q) Set the two APU GEN switches [9] to the OFF position.
- (r) Make sure the APU GEN OFF BUS light [10] comes on.
- (s) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

### HAP 001-013, 015-026, 028-054

SUBTASK 49-11-00-860-073

- (2) Do the APU operational test:

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## AIRCRAFT MAINTENANCE MANUAL

HAP 001-013, 015-026, 028-054 (Continued)

- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (b) Operate the APU with no load for a minimum of five minutes.

**NOTE:** For extended APU service life, it is recommended that you operate the APU for two minutes before you apply a pneumatic load. You can apply an electrical load when the APU GEN OFF BUS light comes on.

- (c) Make sure the BUS TRANS switch [12] on the P5 forward overhead panel is in the AUTO position.
- (d) Make sure the APU GEN OFF BUS light [11] comes on.
- (e) Set the AC selector switch [2] to the APU GEN position.
- (f) Look at the CPS FREQ display [1].

**NOTE:** With no load applied to the APU, the CPS FREQ display must become stable at 395 - 405 CPS.

- (g) Set the two APU GEN switches [10] to the ON position and then release.

**NOTE:** One of the two APU GEN switches will connect the APU starter-generator to the two 115V ac transfer busses.

- (h) Make sure the APU GEN OFF BUS light [11] goes off.
- (i) Put an electrical load of 60 amps on the APU starter-generator.

**NOTE:** The APU exhaust gas temperature (EGT) indicator on the P5 forward overhead panel can spike (move) quickly to half scale (400°C - 500°C) when you put an electrical load on the APU starter-generator and then move down to zero after a few bounces. This APU condition is satisfactory.

- (j) Set these switches on the P5 forward overhead panel:
  - 1) Set the ISOLATION VALVE switch [6] to the OPEN position.
  - 2) Make sure the engine 1 BLEED switch [9] and engine 2 BLEED switch [7] are in the OFF position.
  - 3) Make sure the L PACK switch [4] and R PACK switch [5] are in the OFF position.
  - 4) Set the APU BLEED switch [8] to the ON position.
  - 5) Set the three switches [3] for the cabin temperature control to the AUTO position.
  - 6) Set the L PACK switch [4] and R PACK switch [5] to the AUTO position.

**NOTE:** It is recommended that you operate the APU with the two air conditioning packs when maximum cabin cooling is necessary. Use the two air conditioning packs as an alternative to the one air conditioning pack operation. The results of the operation of two air conditioning packs will be cooler cabin temperatures, lower APU fuel burn, better APU hot section life and lower APU noise. Refer to Service Letter 737-SL-49-060 for more data on these results.

- (k) Let the APU exhaust gas temperature (EGT) become stable (one to two minutes).
- (l) Set the L PACK switch [4] and R PACK switch [5] to the HIGH position.
- (m) Let the APU exhaust gas temperature (EGT) become stable (one to two minutes).

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HAP 001-013, 015-026, 028-054 (Continued)

(n) Look at the CPS FREQ display [1].

NOTE: With the APU fully loaded, the CPS FREQ display must become stable at 395 - 405 CPS. A small change in the APU starter-generator frequency (2 - 4 CPS) and the bleed duct pressure (1 - 2 psi) are permitted for the fully loaded condition.

(o) Set these switches on the P5 forward overhead panel to remove the pneumatic load:

- 1) Set the L PACK switch [4] and R PACK switch [5] to the OFF position.
- 2) Set the three switches [3] for the cabin temperature control to the OFF position.
- 3) Set the APU BLEED switch [8] to the OFF position.
- 4) Set the ISOLATION VALVE switch [6] to the CLOSE position.

(p) Remove the electrical load from the APU starter-generator.

(q) Set the two APU GEN switches [10] to the OFF position.

(r) Make sure the APU GEN OFF BUS light [11] comes on.

(s) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

**HAP ALL**

————— END OF TASK —————

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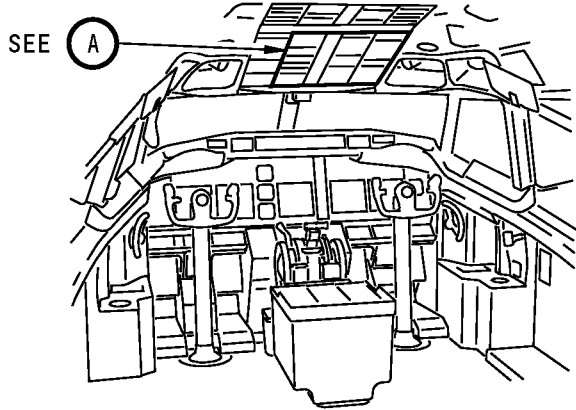
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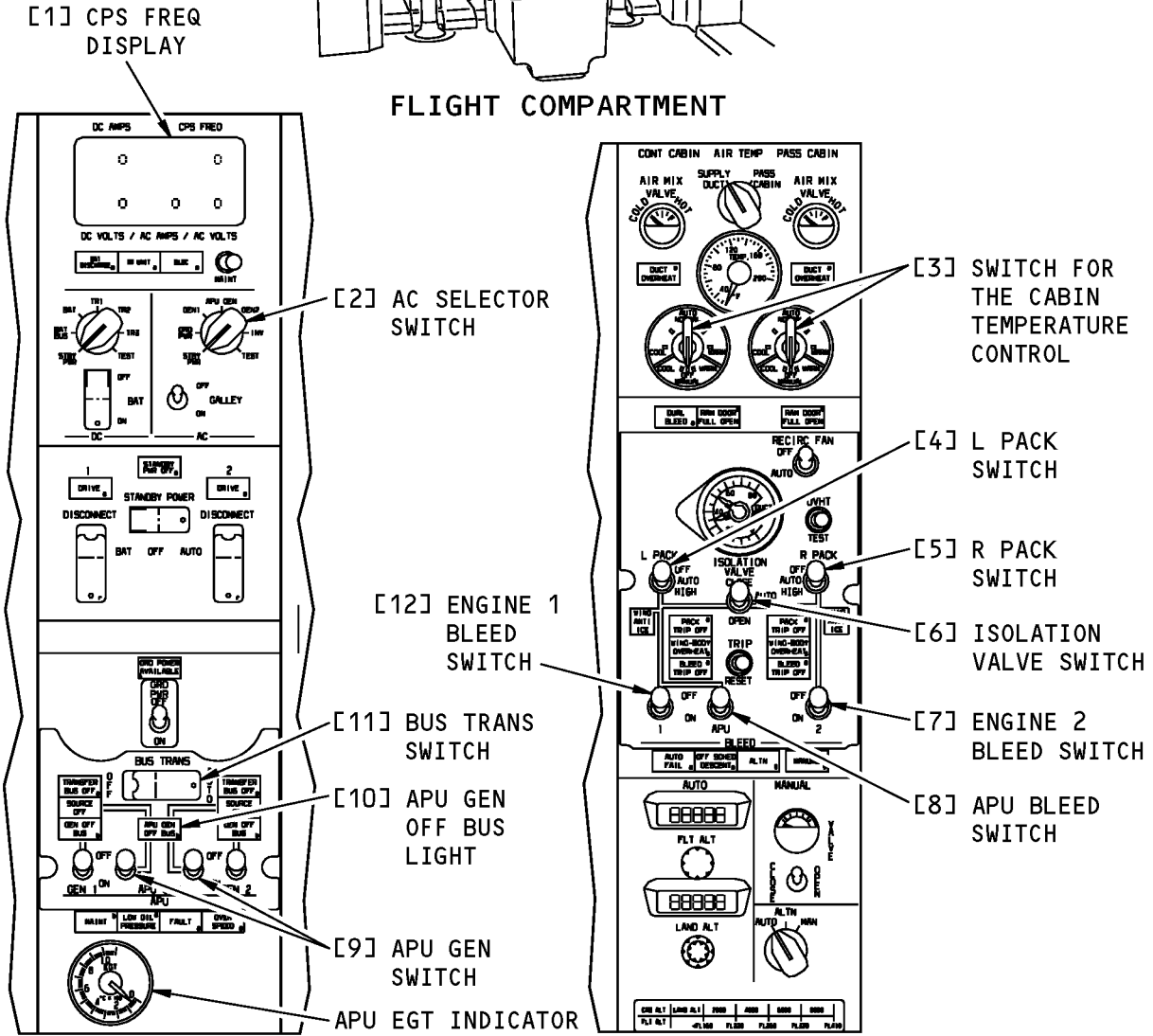
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**FLIGHT COMPARTMENT**



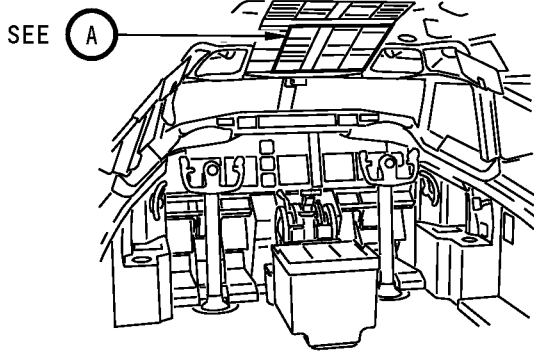
**FORWARD OVERHEAD PANEL, P5**



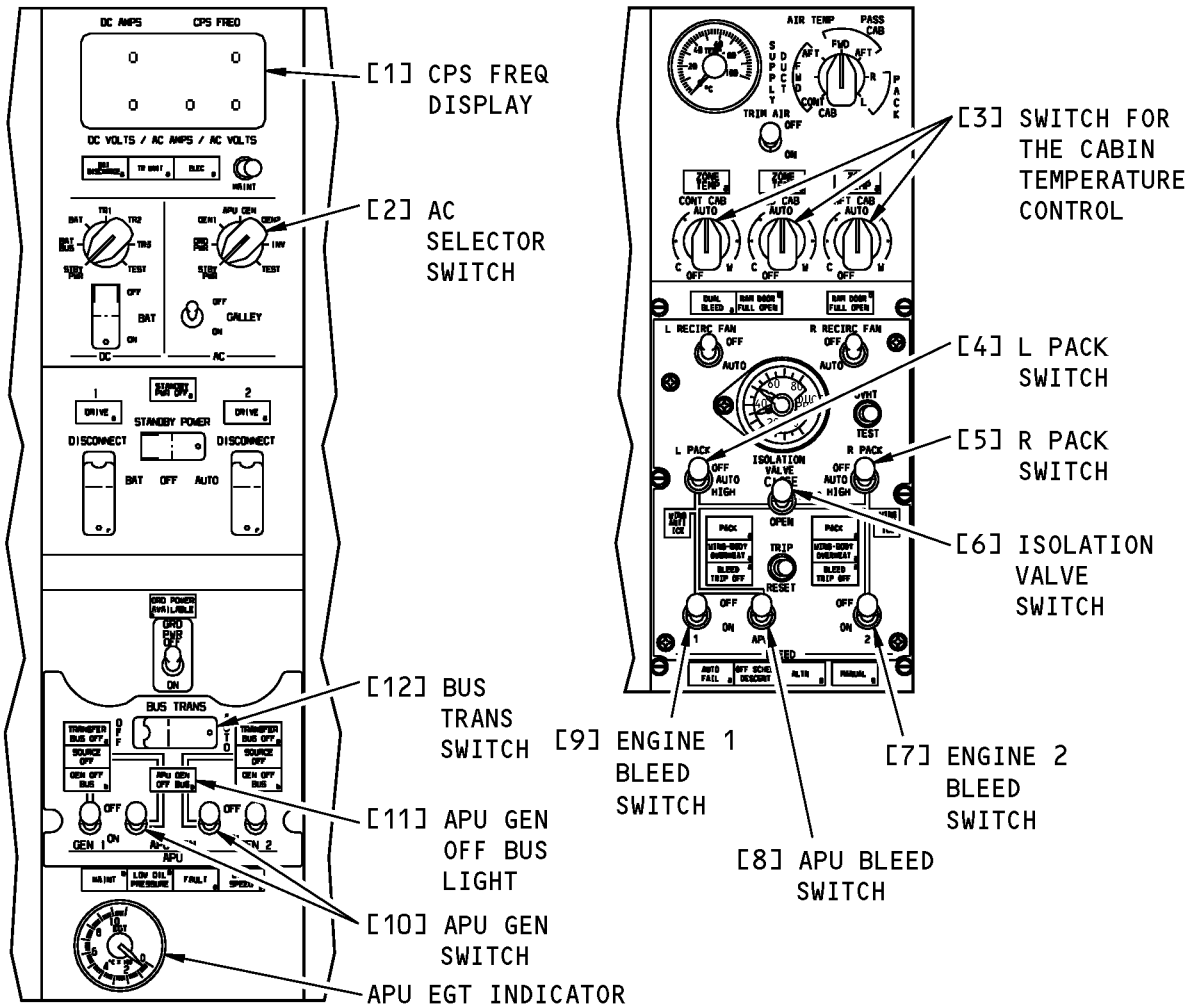
**APU Operational Test  
Figure 501 (Sheet 1 of 2)/49-11-00-990-803**

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**FLIGHT COMPARTMENT**



**FORWARD OVERHEAD PANEL, P5**



**APU Operational Test**

Figure 501 (Sheet 2 of 2)/49-11-00-990-803

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## APU POWER PLANT - INSPECTION/CHECK

### 1. General

A. This procedure has these tasks:

- (1) A visual inspection of the APU power plant
- (2) An inspection after an APU power plant fire.

#### **TASK 49-11-00-200-801**

### 2. APU Power Plant Inspection

A. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-13-11-200-801	APU Mounts Inspection (APU Removed) (P/B 601)
49-15-11-200-801	Air Inlet Seal Inspection (P/B 601)
49-16-11-100-801	Clean the APU Drains (P/B 701)
49-17-11-200-801	Insulation Panel Inspection (P/B 601)
49-81-11-200-801	Exhaust Duct Muffler Inspection (P/B 601)
49-91-13-200-801	Oil Filter Indicator Inspection (P/B 601)
49-91-41-200-801	Oil Cooler Inspection (P/B 601)
49-91-71-200-801	Eductor Inlet Duct Inspection (P/B 601)
49-91-81-200-801	Magnetic Drain Plug Inspection (P/B 601)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Inspection

SUBTASK 49-11-00-860-014

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-11-00-860-015

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-11-00-010-005

- (3) To open the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A:
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### E. Procedure

SUBTASK 49-11-00-210-012

- (1) Do these steps to inspect the APU power plant:

- (a) If the APU is removed from the APU compartment, then do these steps:
  - 1) Visually examine the air inlet seal for deformation, wear and damage.
    - a) If you find signs of deformation, wear or damage, do this task: Air Inlet Seal Inspection, TASK 49-15-11-200-801.
  - 2) Visually examine the front area and inner surfaces of the exhaust duct muffler that you can get access from the APU compartment for cracks and damage.
    - a) If you find cracks or signs of damage, do this task: Exhaust Duct Muffler Inspection, TASK 49-81-11-200-801.
  - 3) Visually examine the inner surfaces of the seal depressor assembly for damaged painted surfaces which include signs of paint peeling and missing paint.
    - a) Signs of paint peeling and/or missing paint are permitted on the inner surfaces of the seal depressor assembly.
  - 4) Visually examine the air inlet duct that you can get access from the APU compartment for blockage of unwanted materials.
    - a) If you find blockage of unwanted materials, remove the blockage.
- (b) Visually examine the air inlet duct that you can get access for blockage of unwanted materials and damage that can cause a decrease in airflow.
  - 1) If you find blockage of unwanted materials, remove the blockage.
  - 2) If you find damage that can cause a decrease in airflow, then repair the problems that you find.
- (c) Measure the height of the air inlet seal with the APU installed.

**NOTE:** The height from the bottom to the top of the air inlet seal (between the inlet adapter assembly and the APU) must be less than 1.125 inches (28.6 mm).
- (d) Do these steps to visually examine the compressor inlet plenum for blockage of unwanted materials:
  - 1) Loosen the eight captive screws that attach the access door to the compressor inlet plenum.

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- 2) Remove the access door from the compressor inlet plenum.  
NOTE: A lanyard is attached to the access door to keep the access door with the APU.
- 3) Visually examine the compressor inlet plenum for blockage of unwanted materials.
  - a) If you find blockage of unwanted materials, then remove the blockage.
- 4) Re-install the access door to the compressor inlet plenum with the eight captive screws.
- (e) Visually examine the four APU mounts for cracks, corrosion and damage.
  - 1) If you find cracks or signs of corrosion or damage, do this task: APU Mounts Inspection (APU Removed), TASK 49-13-11-200-801.
- (f) Visually examine the seven insulation panels for holes, tears, separation and damage.
  - 1) If you find holes, tears, separation or signs of damage, do this task: Insulation Panel Inspection, TASK 49-17-11-200-801.
- (g) Visually examine the front area and inner surfaces of the eductor inlet duct that you can get access from the APU compartment for damage.
  - 1) If you find signs of damage, do this task: Eductor Inlet Duct Inspection, TASK 49-91-71-200-801.
- (h) Visually examine the APU compartment structure for cracks, wear and damage.

### HAP 020-026, 028-054, 101-999

- (i) Visually examine the air inlet scoop on the lower forward right side of the APU compartment for blockage of unwanted materials and damage.

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- (j) Examine these components of the APU power plant for tightness, worn areas, cracks and corrosion:
  - 1) Electrical connectors for the starter-generator wire harness
  - 2) Electrical connectors for the engine wire harness
  - 3) Four terminal lugs (T1), (T2), (T3) and (T4) on the fanning strip for the starter-generator
  - 4) Four exhaust gas temperature (EGT) thermocouple leads for the EGT thermocouple 1 and EGT thermocouple 2
  - 5) Spring clips and quick-release clamps that attach the engine wire harness to the APU
  - 6) Clamps and connections that attach the fuel and oil tubes to the APU.
- (k) Visually examine the oil and fuel tubes for kinks, cracks and leakage.

NOTE: During an APU operation, a fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted from the forward drain on the APU drain seal.

- 1) If you find kinks, cracks or leakage from the oil and/or fuel tubes, repair the problems that you find.
  - 2) If you find more than the fuel leakage rate, then do a check of the witness drain tees to isolate the problem to the fuel control unit, inlet guide vane (IGV) actuator or the surge control valve.
- (l) Visually inspect and clean the APU drains. To inspect and clean the APU drains, do this task: Clean the APU Drains, TASK 49-16-11-100-801.

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- (m) Use the oil sight glass to visually inspect the APU oil level. To inspect it, do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.

NOTE: You can find the oil sight glass on the aft side of the APU gearbox.

- (n) Visually examine the red button on the oil filter indicator for the lube filter housing.
- 1) If the red button on the oil filter indicator has extended, do this task: Oil Filter Indicator Inspection, TASK 49-91-13-200-801.
- (o) Inspect the magnetic element for the magnetic drain plug. To inspect it, do this task: Magnetic Drain Plug Inspection, TASK 49-91-81-200-801.
- (p) Visually inspect the oil cooler for blockage of unwanted materials, contamination and damage.
- 1) If you find blockage of unwanted materials, remove the blockage.
  - 2) If you find contamination or signs of damage, do this task: Oil Cooler Inspection, TASK 49-91-41-200-801.

- (q) Examine these systems of the APU power plant for tightness and damage:

- 1) The APU fuel system:
  - a) Fuel control unit
  - b) Ten fuel nozzles
  - c) Fuel flow divider
  - d) Primary and secondary fuel manifolds.
- 2) The APU ignition and start system:
  - a) Starter-generator
  - b) Ignition unit
  - c) Igniter plug
  - d) Igniter plug lead.
- 3) The bleed air system for the APU:
  - a) Bleed air valve
  - b) Inlet guide vane (IGV) actuator
  - c) Inlet pressure sensor (P2)
  - d) Total pressure sensor (PT)

NOTE: The drain hole on the total pressure tube removes unwanted fluids from the total pressure sensor (PT).

- e) Delta pressure sensor (DP)

NOTE: The drain holes on the static and total pressure tubes remove fluids from the delta pressure sensor (DP).

### HAP 001-013, 015-017, 019, 031-054, 101-999 PRE SB 131-49-7483

- f) Surge control valve.

NOTE: APUs WITH THE SUPPORT BRACKET ON THE SURGE DUCT (PRE-HONEYWELL-SB 131-49-7483);

If you find cracks in the support bracket of the surge duct, no corrective action is required. The support bracket is located just aft of the surge control valve.

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HAP 001-013, 015-017, 019, 031-054, 101-999 PRE SB 131-49-7483 (Continued)

HAP 018, 020-026, 028-030; HAP 001-013, 015-017, 019, 031-054, 101-999 POST SB 131-49-7483

- g) Surge control valve.

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- 4) The APU controls system:
  - a) Speed sensor
  - b) Inlet temperature sensor (T2).
- 5) The exhaust gas temperature (EGT) indicating system:
  - a) EGT thermocouple 1
  - b) EGT thermocouple 2.
- 6) The APU indicating system:
  - a) Data memory module.
- 7) The APU lubrication system:
  - a) Lube module
  - b) Temperature control valve
  - c) Oil cooler
  - d) Magnetic drain plug
  - e) Oil level sensor
  - f) Oil temperature sensor
  - g) Low oil pressure switch.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-00-860-016

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-860-017

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-11-00-410-005

- (3) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.

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- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
(d) Install the retainer pin in the rod end of the forward hold-open rod.
(e) Install the retainer pin to the spring clip on the aft hold-open rod.
(f) Close the APU Cowl Door, 315A.
(g) Close the three latches.

END OF TASK

TASK 49-11-00-200-802

3. Inspection After an APU Power Plant Fire

A. References

Table with 2 columns: Reference, Title. Rows include 49-11-00-000-801 (APU Power Plant Removal) and 49-11-00-400-801 (APU Power Plant Installation).

B. Tools/Equipment

Table with 2 columns: Reference, Description. Row includes STD-1134 (Vacuum - Source, 24 Inch Hg Minimum).

C. Consumable Materials

Table with 3 columns: Reference, Description, Specification. Rows include B01023 (Cleaner), G00034 (Cotton Wiper), G00110 (Sponge), G02418 (Water), G02439 (Brush), and G50140 (Gloves).

D. Location Zones

Table with 2 columns: Zone, Area. Rows include 211 (Flight Compartment - Left), 315 (APU Compartment - Left), and 316 (APU Compartment - Right).

E. Access Panels

Table with 2 columns: Number, Name/Location. Row includes 315A (APU Cowl Door).

F. Prepare for the Inspection

SUBTASK 49-11-00-860-241

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

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SUBTASK 49-11-00-860-242

(2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-010-014

(3) To open the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

**G. Procedure**

SUBTASK 49-11-00-210-025

(1) Visually examine the APU power plant for the cause of the APU fire or an APU that became too hot.

(a) If you find external damage to the APU, replace the APU.

These are the tasks:

APU Power Plant Removal, TASK 49-11-00-000-801,

APU Power Plant Installation, TASK 49-11-00-400-801.

(b) If you do not find external damage to the APU, refer to the fault isolation manual for the APU fire detection system to find the cause of the high temperature indication.

SUBTASK 49-11-00-210-026

(2) Do these steps to visually examine the APU compartment and its structural components for signs of fire damage:

- (a) Visually examine the APU compartment and its structural components for signs of fire damage.
- (b) Visually examine the four APU mounts and seven insulation panels for signs of fire damage.

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- (c) If you find signs of fire damage in the APU compartment and its structural components, contact Boeing Service Engineering for the disposition of the APU and APU compartment due to a fire condition.

**NOTE:** An APU fire will affect the safety and structural components integrity of the airplane. Boeing engineering and structural repair personnel will review airline operator-supplied information and provide recommendations on a case-by-case basis.

SUBTASK 49-11-00-160-001

- (3) Do these steps to remove and/or clean the fire extinguishing agent used for the APU power plant fire from the external surfaces of the APU and APU compartment:

- (a) Do these steps if foam was the fire extinguishing agent:

**CAUTION:** DO NOT LET THE FOAM GO IN THE HOLES ON THE APU. FOAM THAT STAYS IN THE APU CAN CAUSE CORROSION OF THE ENGINE INTERNAL COMPONENTS.

- 1) Clean the areas of the APU and APU compartment where the foam was used with clean water, cotton wiper, G00034, brush, G02439, sponge, G00110, protective gloves, G50140 or other equivalent equipment.

**NOTE:** It is recommended that you use de-ionized water, G02418 to clean the external surfaces of the oil cooler.

- 2) Make sure you remove all signs of the foam from the APU and APU compartment.

- (b) Do these steps if dry chemical powder was the fire extinguishing agent:

**CAUTION:** DO NOT USE WATER TO REMOVE THE DRY CHEMICAL POWDER FROM THE APU. THE DRY AGENTS IN THE CHEMICAL POWDER, WHEN MIX WITH WATER, WILL MAKE A COMPOUND THAT CAN CAUSE CORROSION. DO NOT LET THE DRY CHEMICAL POWDER GO IN THE HOLES ON THE APU. DRY CHEMICAL POWDER THAT STAY IN THE APU CAN CAUSE CORROSION OF THE ENGINE INTERNAL COMPONENTS.

- 1) Clean the areas of the APU and APU compartment where the dry chemical powder was used with a vacuum ( 24 Inch Hg Minimum), STD-1134 or other equivalent tool to remove the powder.
- 2) If the dry chemical powder was changed to a glaze-like formation due to high temperatures, clean the areas with Ardrox 6025 cleaner, B01023, cotton wiper, G00034, brush, G02439, sponge, G00110, protective gloves, G50140 or other equivalent equipment.
- 3) Make sure you remove all signs of the dry chemical powder from the APU and APU compartment.

- (c) Do these steps if halogen or halon was the fire extinguishing agent:

- 1) In-flight use of the fire extinguishing system is permitted with no special cleaning procedure.

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**WARNING:** DO NOT BREATHE THE GAS FROM THE FIRE EXTINGUISHING AGENT IN THE APU COMPARTMENT AFTER IT IS USED. DO NOT LET THE FIRE EXTINGUISHING AGENT TOUCH YOUR SKIN. YOU MUST HAVE A GOOD FLOW OF AIR AT THE LOCATION WHERE THE AGENT WAS USED. IF YOU DO NOT OBEY THESE PRECAUTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- 2) Ground use of the fire extinguishing system is permitted but make sure the APU cowl door is opened for a minimum of 30 minutes to remove all halogen or halon gases. No special cleaning procedure is necessary.
- 3) If it is necessary, clean the external surfaces of the APU from the power section (combustion chamber) to the turbine exhaust port with clean water, cotton wiper, G00034, brush, G02439, sponge, G00110, protective gloves, G50140 or other equivalent equipment.

**NOTE:** It is recommended that you use de-ionized water, G02418 to clean the external surfaces of the oil cooler.

#### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-00-860-243

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-860-244

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-11-00-410-010

- (3) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— END OF TASK —————

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## APU POWER PLANT - REPAIR

### 1. General

A. This procedure has this task:

- (1) A repair of the APU compressor inlet door fasteners.

### **TASK 49-11-00-300-801**

### 2. Repair the APU Compressor Inlet Access Door Fasteners

A. Tools/Equipment

Reference	Description
STD-725	Punch

B. Consumable Materials

Reference	Description	Specification
B50126	Solvent - Degreasing, General Purpose	MIL-PRF-680
G50316	Cloth - Clean, Dry, Lint-free, White, Cotton	

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Stud	49-15-22-02-006	HAP 001-013, 015-026, 028-030
4	Retaining Spring	49-15-22-02A-010 49-15-22-02-008	HAP 031-054, 101-999 HAP 001-013, 015-026, 028-030
5	Grommet	49-15-22-02A-020 49-15-22-02-007 49-15-22-02A-015	HAP 031-054, 101-999 HAP 001-013, 015-026, 028-030 HAP 031-054, 101-999

D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Prepare for the repair

SUBTASK 49-11-00-860-295

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-11-00-860-296

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-010-016

(3) To open the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A:
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

## G. Procedure

SUBTASK 49-11-00-000-001

(1) To remove the Access Door [1] do these steps:

- (a) Remove the Bolt [2] that attaches the Lanyard to the compressor inlet plenum.
- (b) Loosen the eight captive screws that attach the Access Door [1] to the compressor inlet plenum.
- (c) Remove the Access Door [1] from the compressor inlet plenum.

SUBTASK 49-11-00-300-001

(2) To repair the compressor inlet access door fasteners do these steps:

- (a) Remove any damaged Studs [3], Retaining Springs [4], or Grommets [5] from the Access Door [1].

**WARNING:** CLEANING OPERATIONS USING SOLVENTS SHOULD BE PERFORMED IN A WELL-VENTILATED ATMOSPHERE. EXERCISE NORMAL SAFETY PRECAUTIONS DURING USE. REPEATED OR PROLONGED CONTACT WITH THE SKIN COULD CAUSE INJURY TO PERSONNEL.

- (b) Clean the Studs [3], Retaining Springs [4], Grommets [5], and holes of the Access Door [1] with a cotton cloth, G50316 and degreasing solvent, B50126.
- (c) Install the new Grommets [5] into the Access Door [1] with a punch, STD-725.
- (d) Install the new Retaining Springs [4] and new Studs [3] on the Access Door [1].

SUBTASK 49-11-00-400-001

(3) To install the Access Door [1] do these steps:

- (a) Install the Bolt [2] that attaches the Lanyard to the compressor inlet plenum.
- (b) Install the Access Door [1] to the compressor inlet plenum with the eight captive screws.

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### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-00-860-297

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-860-298

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-11-00-410-011

- (3) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- Remove the two retainer pins from the two hold-open rods in the APU compartment.
- Disconnect the two hold-open rods from the two brackets.
- Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- Install the retainer pin in the rod end of the forward hold-open rod.
- Install the retainer pin to the spring clip on the aft hold-open rod.
- Close the APU Cowl Door, 315A.
- Close the three latches.

————— **END OF TASK** —————

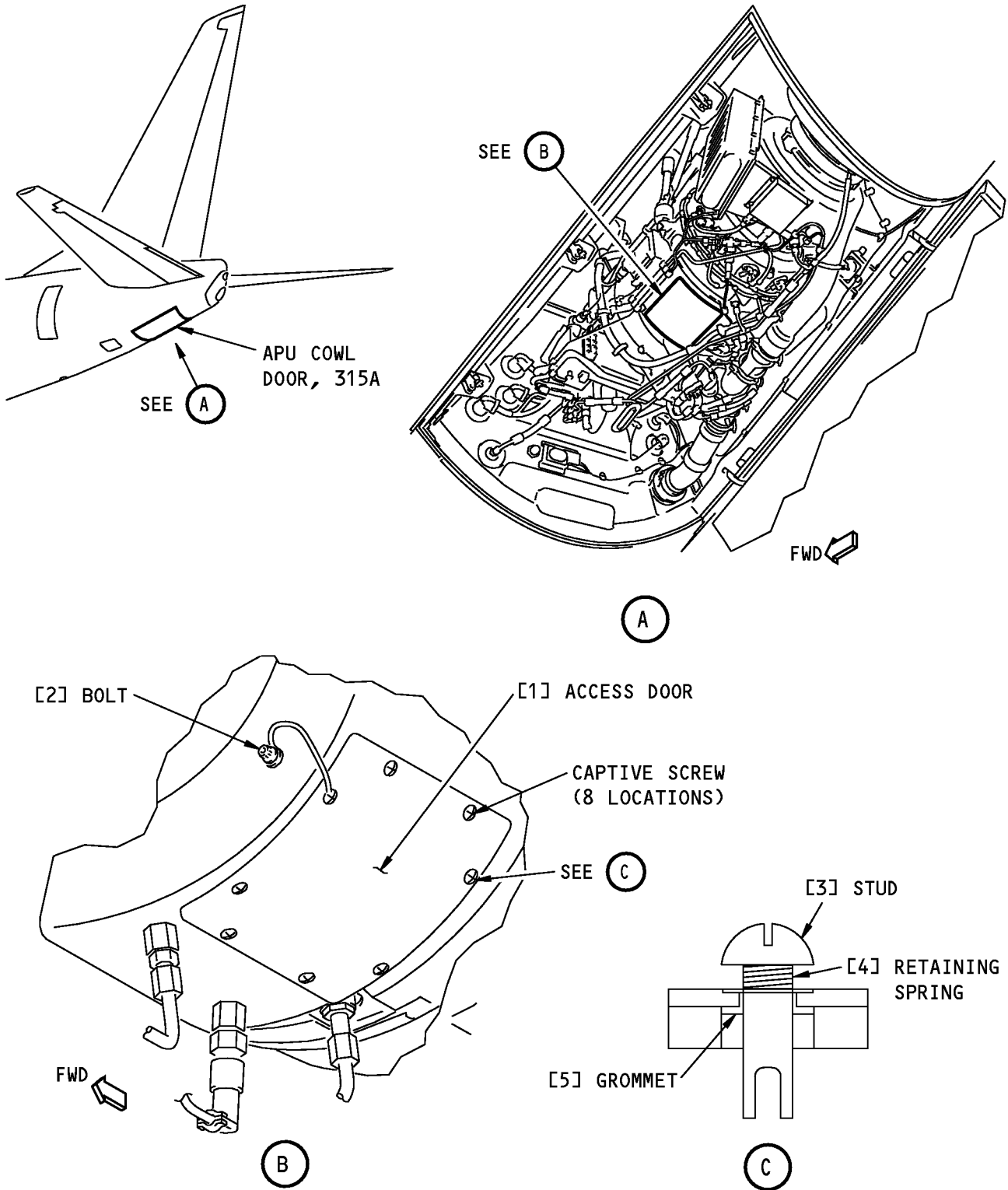
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**APU Compressor Inlet Access Door Fastener Repair  
Figure 801/49-11-00-990-808**

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## APU HARNESS - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the starter-generator wire harness
- (2) An installation of the starter-generator wire harness
- (3) A removal of the engine wire harness
- (4) An installation of the engine wire harness.

B. The APU has two wire harnesses. The starter-generator wire harness is installed on the starter-generator and the 1088 bulkhead. The engine wire harness is installed on the APU and the 1088 bulkhead.

### **TASK 49-11-01-000-801**

### 2. Starter-Generator Wire Harness Removal

(Figure 401)

A. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

B. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

C. Prepare for the Removal

SUBTASK 49-11-01-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-11-01-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-01-010-001

- (3) To open the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.

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- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### D. Starter-Generator Wire Harness Removal

SUBTASK 49-11-01-020-001

- (1) Do these steps to remove the wire harness [2] for the starter-generator:
  - (a) Disconnect the electrical connector D11118 (P4) [1] from the APU firewall receptacle on the 1088 bulkhead.
  - (b) Disconnect the electrical connector (P5) [3] from the starter-generator.
  - (c) Disconnect the electrical connector (P6) [4] from the starter-generator.
  - (d) Remove the wire harness [2].
  - (e) Install the caps on the electrical connectors to prevent contamination.

————— END OF TASK —————

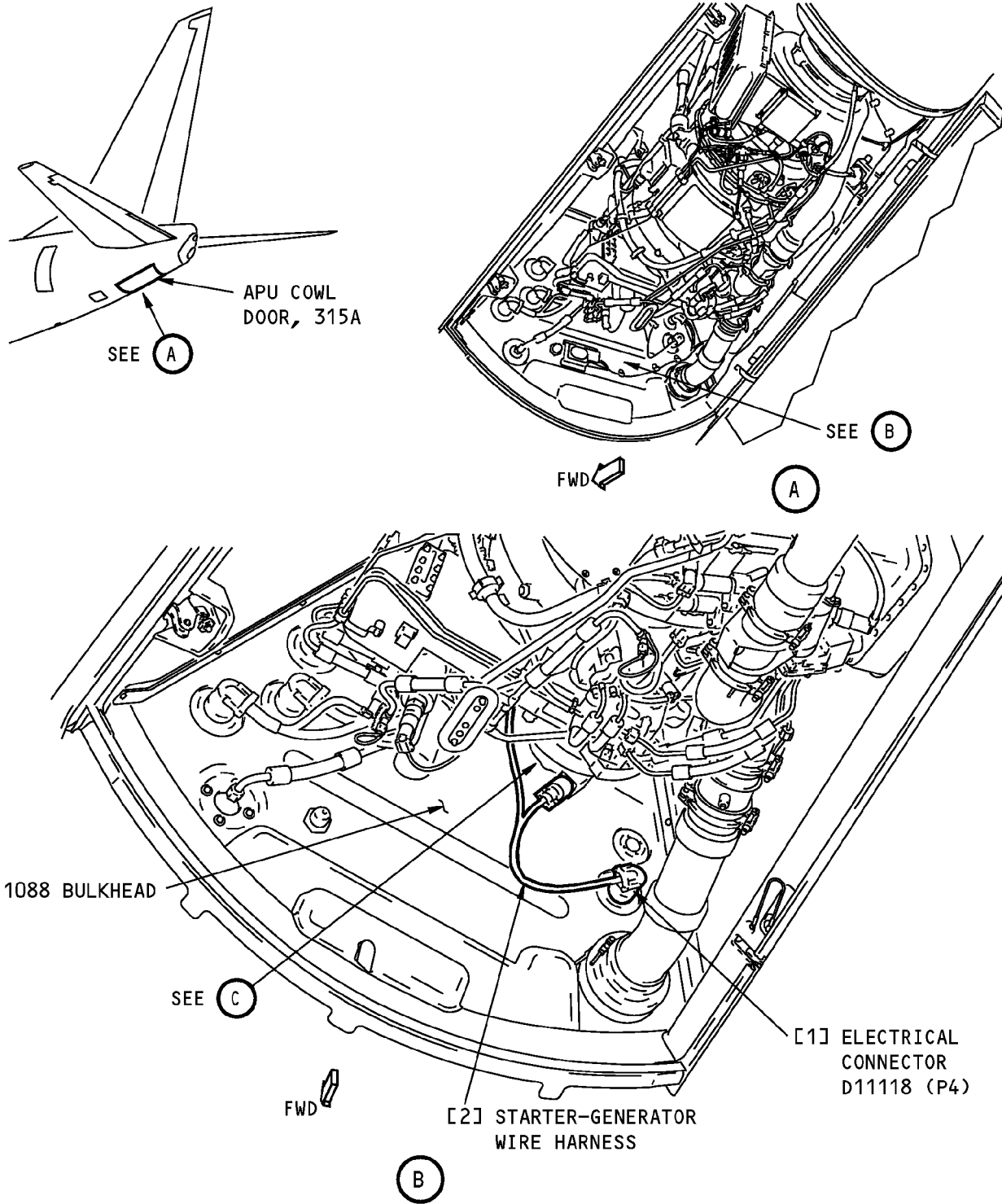
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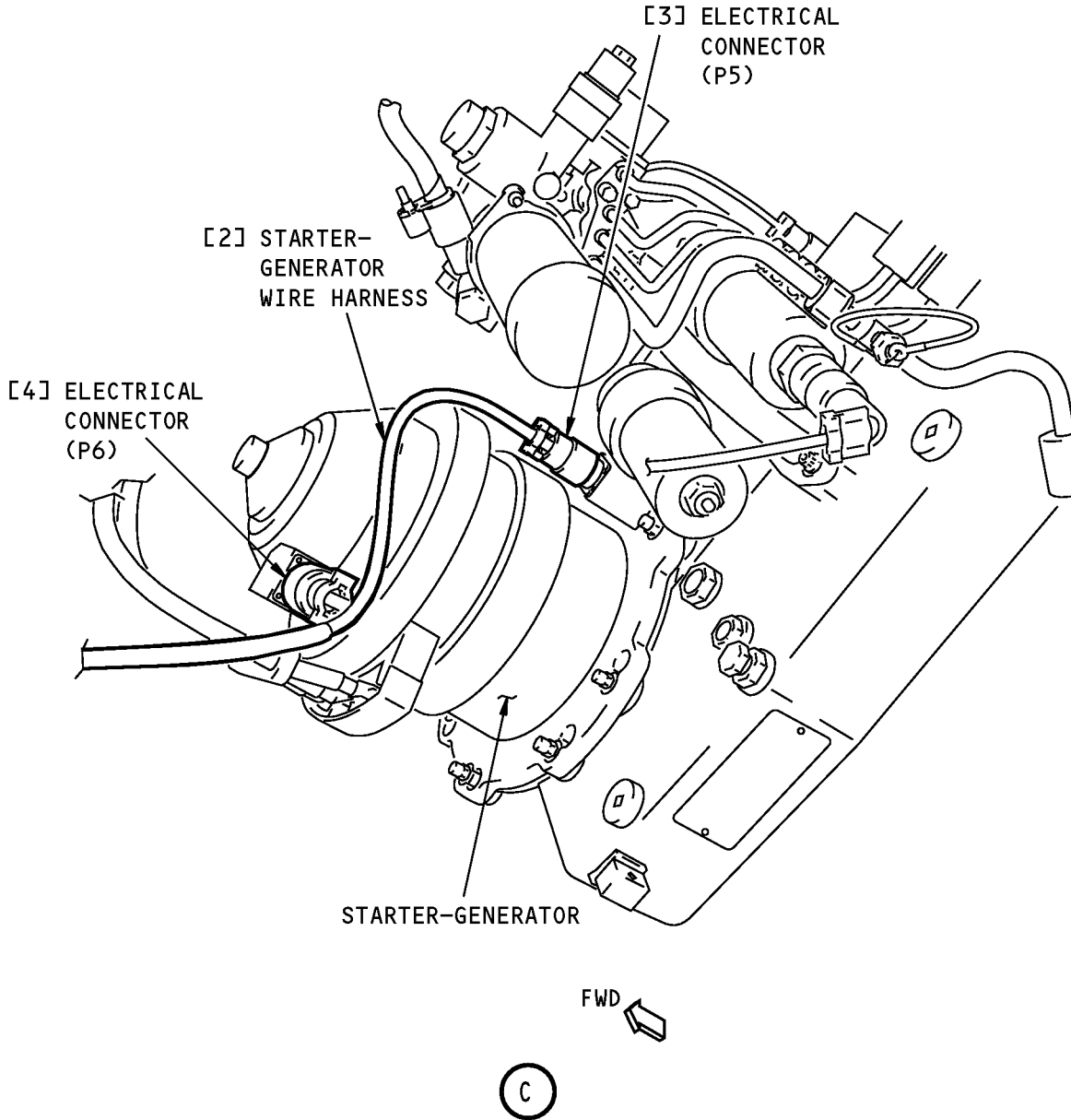
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**Starter-Generator Wire Harness Installation  
Figure 401 (Sheet 1 of 2)/49-11-01-990-801**

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**Starter-Generator Wire Harness Installation  
Figure 401 (Sheet 2 of 2)/49-11-01-990-801**

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**TASK 49-11-01-400-801**

#### 3. Starter-Generator Wire Harness Installation

(Figure 401)

##### A. References

Reference	Title
49-11-00-710-801	APU Operational Test (P/B 501)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

##### B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Wire harness	49-11-01-01-010	HAP 001-013, 015-026, 028-030
		49-11-01-02-010	HAP 031-054, 101-999

##### C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

##### D. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### E. Procedure

SUBTASK 49-11-01-420-001

- (1) Do these steps to install the wire harness [2] for the starter-generator:
  - (a) Remove the caps from the electrical connectors.
  - (b) Put the wire harness [2] near the 1088 bulkhead.
  - (c) Connect the electrical connector (P6) [4] to the starter-generator.
  - (d) Connect the electrical connector (P5) [3] to the starter-generator.
  - (e) Connect the electrical connector D11118 (P4) [1] to the APU firewall receptacle on the 1088 bulkhead.

##### F. Starter-Generator Wire Harness Installation Test

SUBTASK 49-11-01-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-11-01-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-11-01-710-001

- (3) Do this task: APU Operational Test, TASK 49-11-00-710-801.

SUBTASK 49-11-01-740-001

- (4) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
  - (a) If maintenance message(s) show for the APU electrical system or the starter-generator, refer to the applicable Maintenance Message Index in the FIM.

SUBTASK 49-11-01-860-005

- (5) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

#### G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-01-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— END OF TASK —————

#### TASK 49-11-01-000-802

### 4. Engine Wire Harness Removal

(Figure 402)

#### A. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### B. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### C. Prepare for the Removal

SUBTASK 49-11-01-860-006

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

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SUBTASK 49-11-01-860-007

(2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-01-010-002

(3) To open the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### D. Engine Wire Harness Removal

SUBTASK 49-11-01-020-002

(1) Do these steps to remove the engine wire harness [25]:

- (a) Disconnect the electrical connector (P13) [51] from the ignition unit.
- (b) Disconnect the four exhaust gas temperature (EGT) leads [59], [61]:
  - 1) Remove the two nuts [60] that attach the two EGT leads [61] to the EGT thermocouple 1.  
**NOTE:** There are two different nuts that attach the two EGT leads to each thermocouple. The nut for the alumel stud is larger than the nut for the chromel stud.
  - 2) Remove the two nuts [58] that attach the two EGT leads [59] to the EGT thermocouple 2.
  - 3) Disconnect the four EGT leads [61], [59].
- (c) Release the engine wire harness [25] from the three spring clips [52], [53], [54].
- (d) Disconnect the electrical connector (P9) [57] from the surge control valve.
- (e) Release the engine wire harness [25] from the two spring clips [55], [56].
- (f) Disconnect the electrical connector (P23) [50] from the flow divider solenoid for the fuel flow divider.
- (g) Release the engine wire harness [25] from the two spring clips [49], [39].
- (h) Disconnect the electrical connector (P21) [40] from the inlet temperature sensor.
- (i) Disconnect the electrical connector (P20) [41] from the delta pressure sensor.

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- (j) Disconnect the electrical connector (P19) [42] from the total pressure sensor.
- (k) Release the engine wire harness [25] from the spring clip [38].
- (l) Disconnect the electrical connector (P10) [48] from the bleed air valve.
- (m) Disconnect the electrical connector (P18) [43] from the inlet pressure sensor.
- (n) Disconnect the electrical connector (P12) [44] from the speed sensor.
- (o) Disconnect the electrical connector (P17) [47] from the inlet guide vane (IGV) actuator.
- (p) Release the engine wire harness [25] from the seven spring clips [49], [45], [46], [35], [36], [37].
- (q) Disconnect the electrical connector (P11) [34] from the data memory module.
- (r) Disconnect the electrical connector (P16) [32] from the oil level sensor.
- (s) Release the engine wire harness [25] from the spring clip [33].
- (t) Open the two quick-release clamps [26].
  - 1) Release the engine wire harness [25] from the two quick-release clamps [26].
- (u) Disconnect the electrical connector (P24) [28] from the filter bypass switch (oil filter indicator on the generator filter housing).
- (v) Release the engine wire harness [25] from the two spring clips [29].
- (w) Disconnect the electrical connector (P14) [31] from the low oil pressure switch.
- (x) Disconnect the electrical connector (P15) [30] from the oil temperature sensor.
- (y) Open the quick-release clamp [27].
  - 1) Release the engine wire harness [25] from the quick-release clamp [27].
- (z) Disconnect the electrical connector (P22) [24] from the fuel control unit.
- (aa) Disconnect the three electrical connectors [21], [22], [23] from the APU firewall receptacles on the 1088 bulkhead:
  - 1) Disconnect the electrical connector D10436 (P2) [21].
  - 2) Disconnect the electrical connector D10912 (P1) [22].
  - 3) Disconnect the electrical connector D10434 (P3) [23].
- (ab) Remove the engine wire harness [25].
- (ac) Install the caps on the electrical connectors.

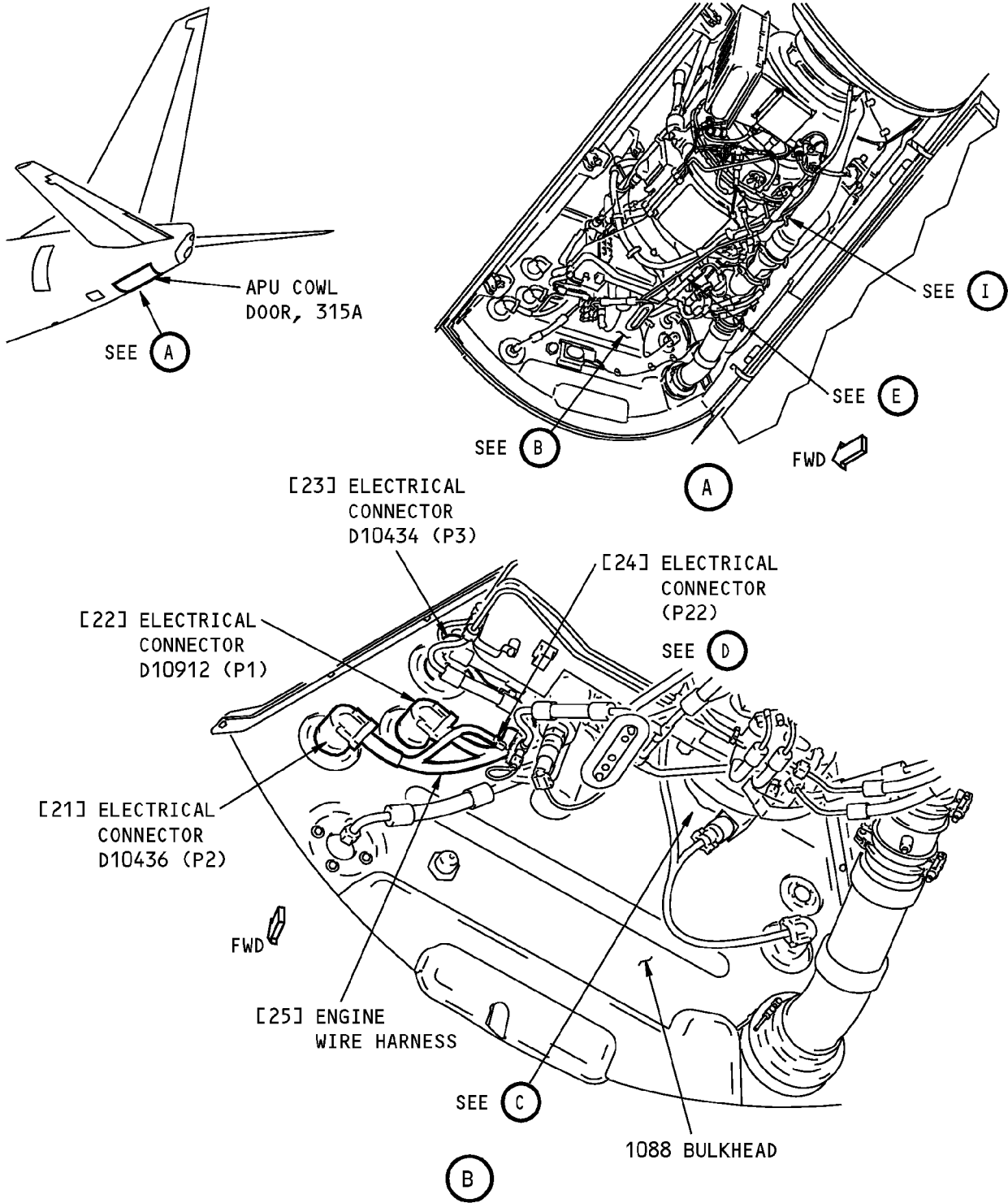
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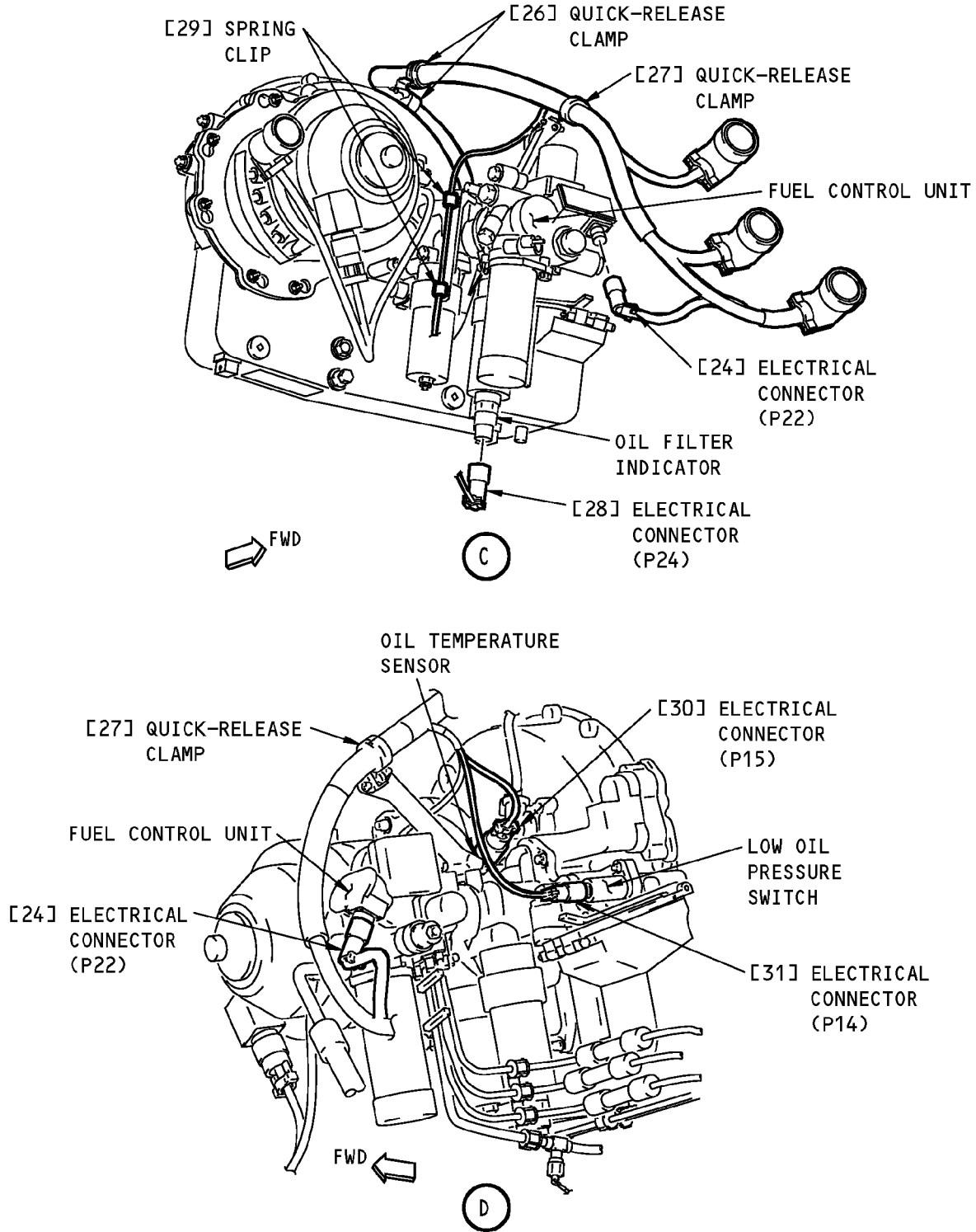
**Engine Wire Harness Installation**  
**Figure 402 (Sheet 1 of 7)/49-11-01-990-802**

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[34] ELECTRICAL  
CONNECTOR  
(P11)

DATA  
MEMORY  
MODULE

[33] SPRING  
CLIP

[32] ELECTRICAL  
CONNECTOR  
(P16)

[25] ENGINE WIRE  
HARNESS

OIL LEVEL  
SENSOR

[37] SPRING  
CLIP

SEE (F)

[36] SPRING  
CLIP

BLEED AIR VALVE  
SEE (H)

[35] SPRING  
CLIP

FWD 

(E)

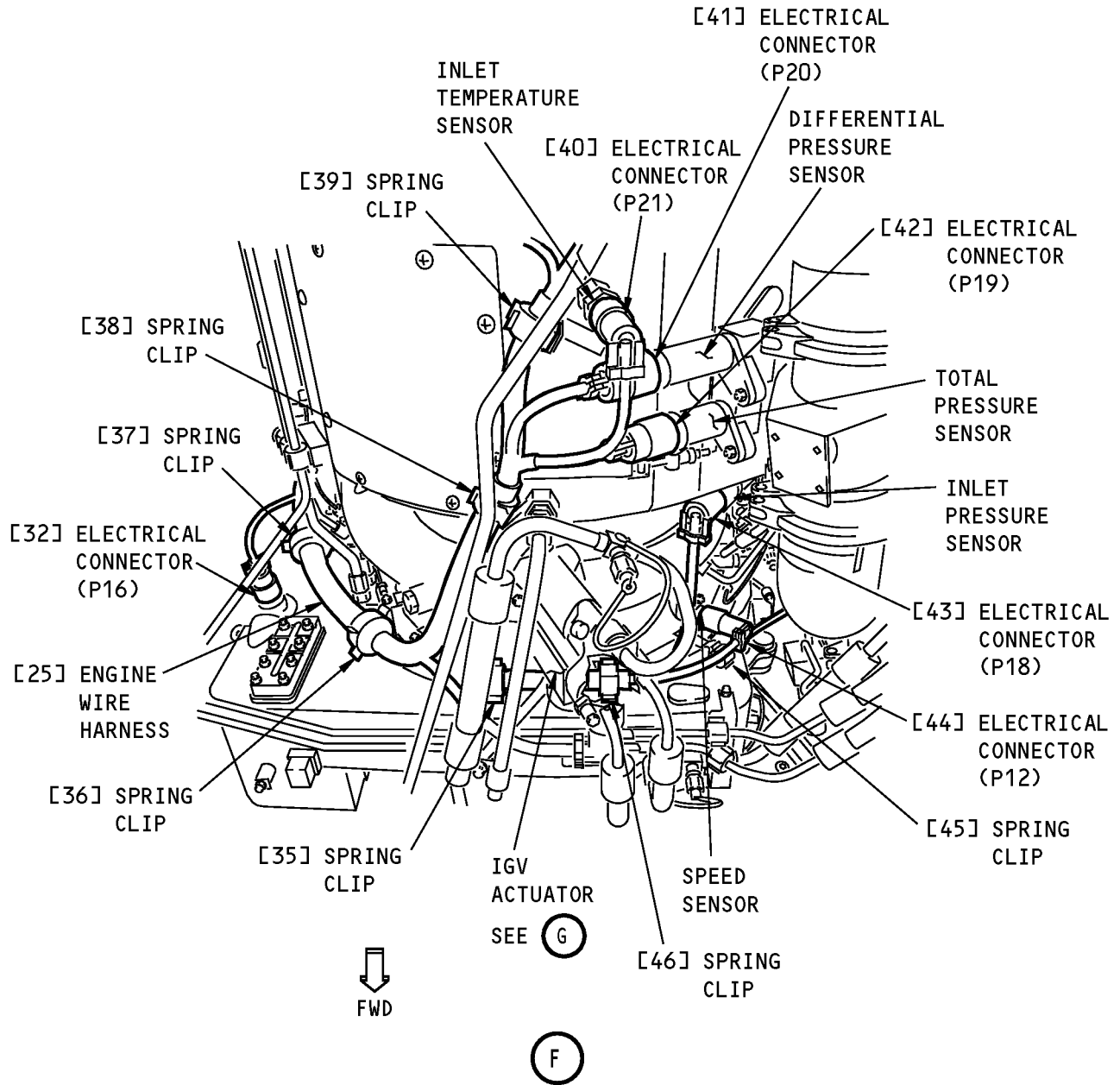
**Engine Wire Harness Installation**  
**Figure 402 (Sheet 3 of 7)/49-11-01-990-802**

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**Engine Wire Harness Installation**  
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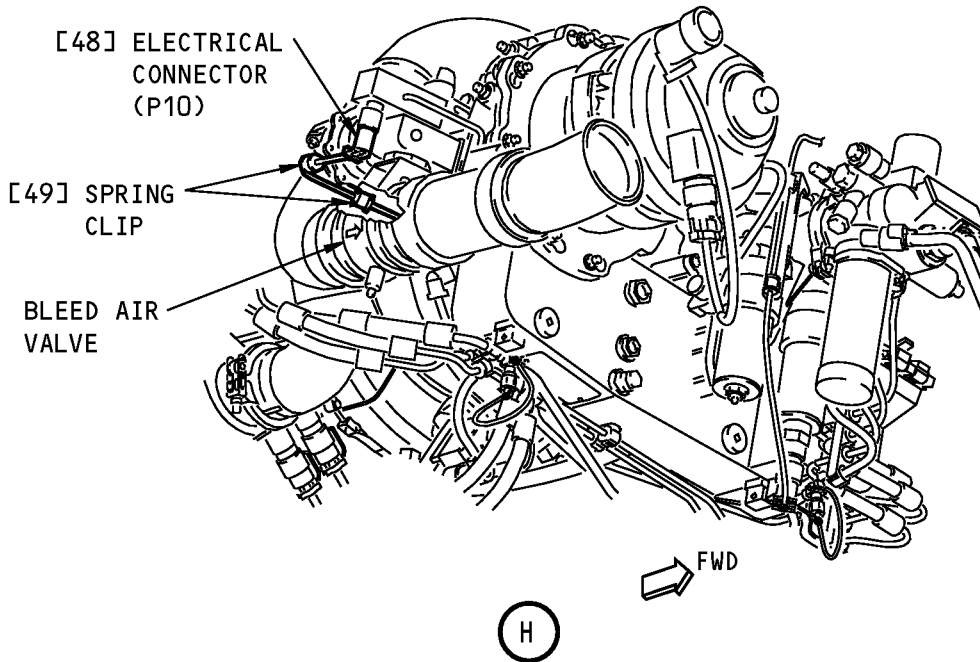
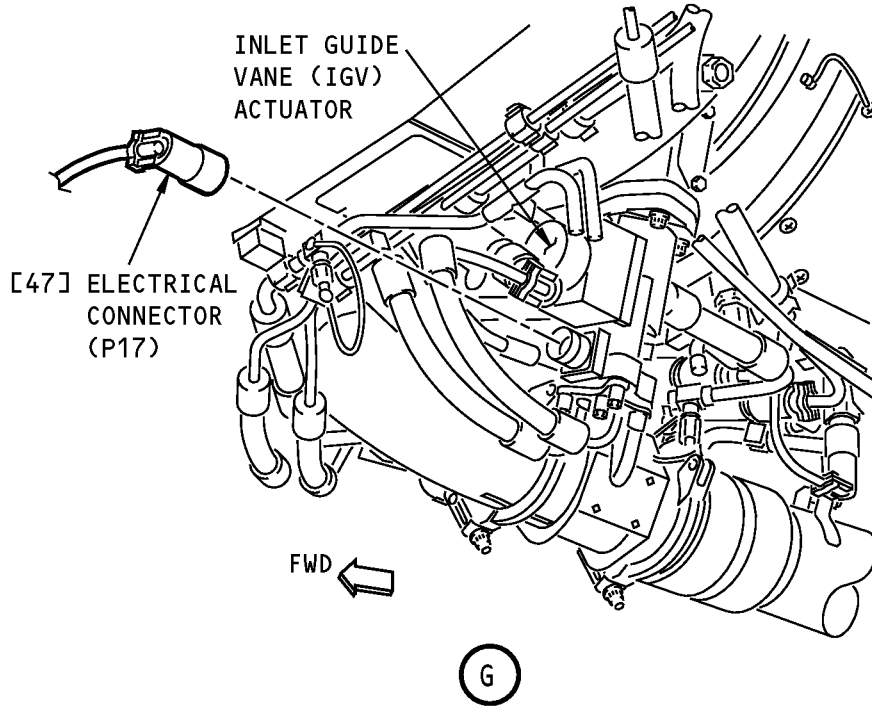
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**Engine Wire Harness Installation**  
**Figure 402 (Sheet 5 of 7)/49-11-01-990-802**

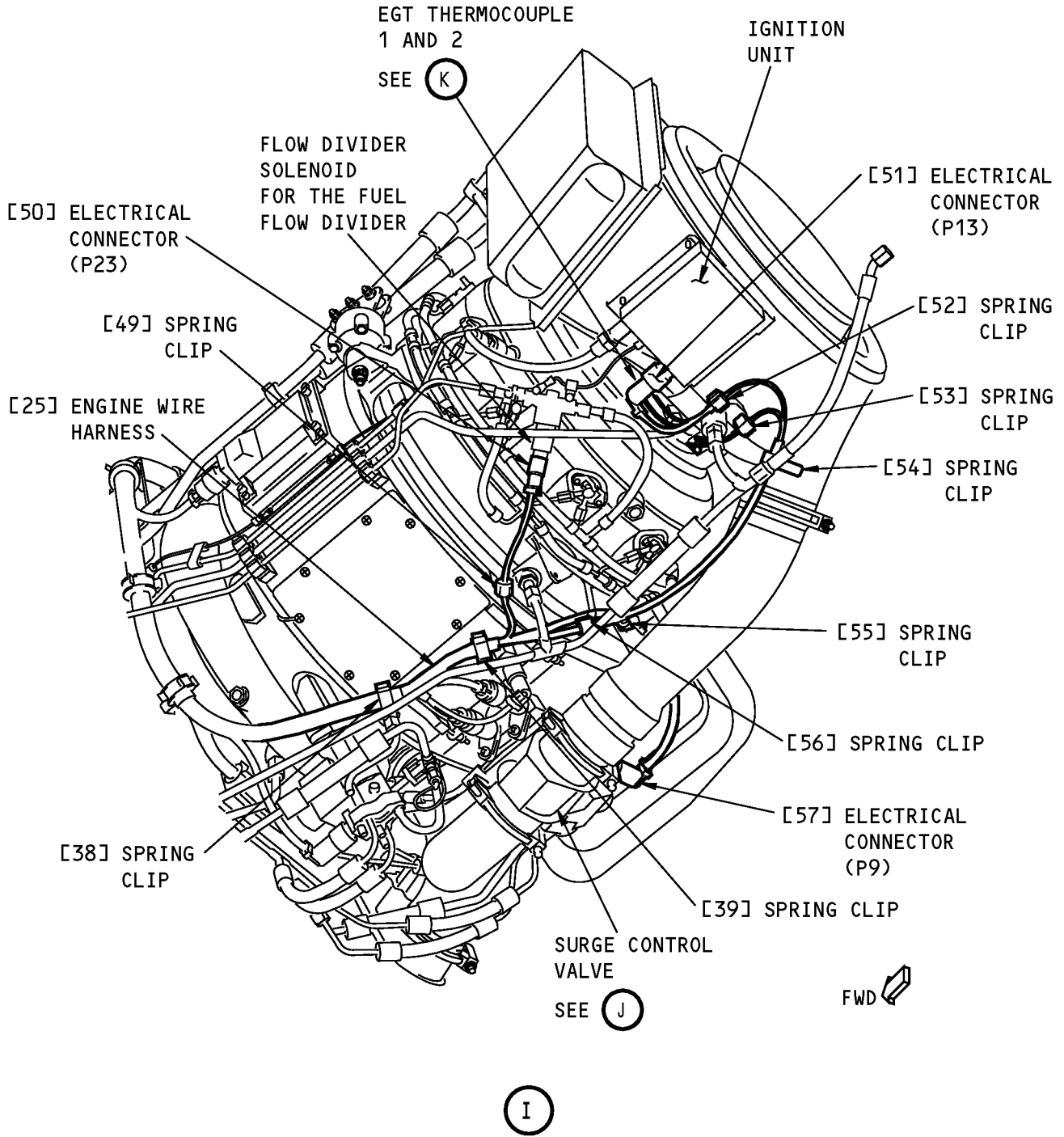
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**Engine Wire Harness Installation**  
**Figure 402 (Sheet 6 of 7)/49-11-01-990-802**

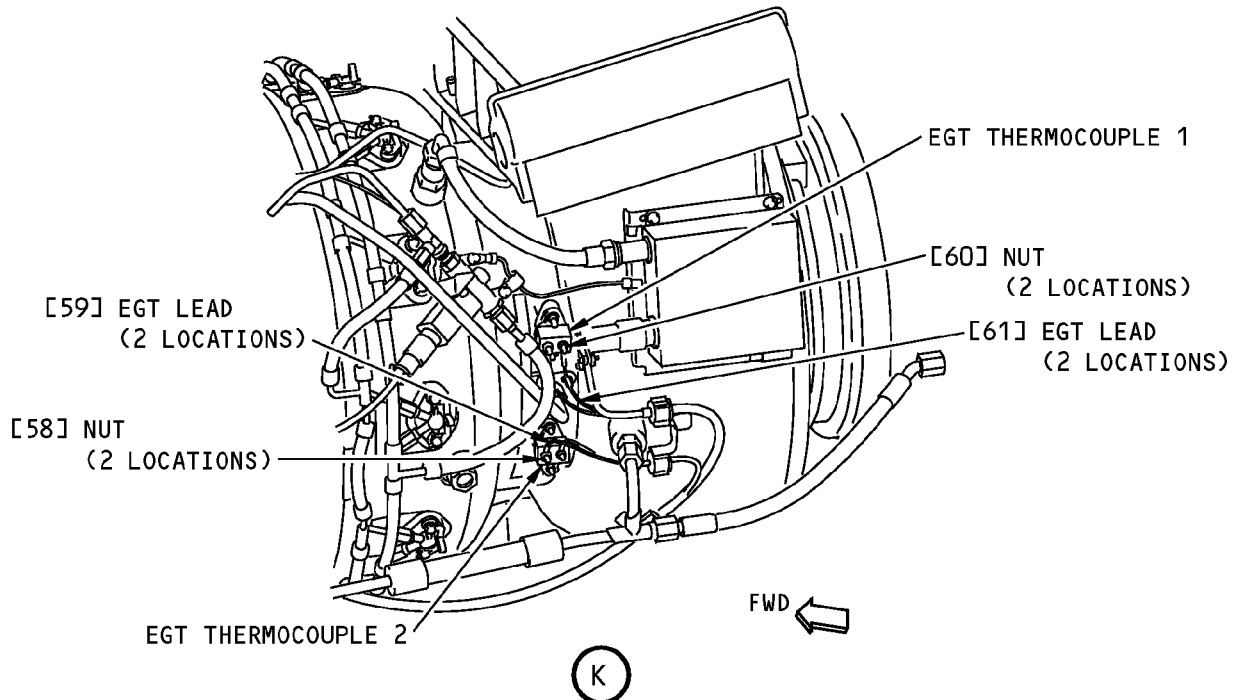
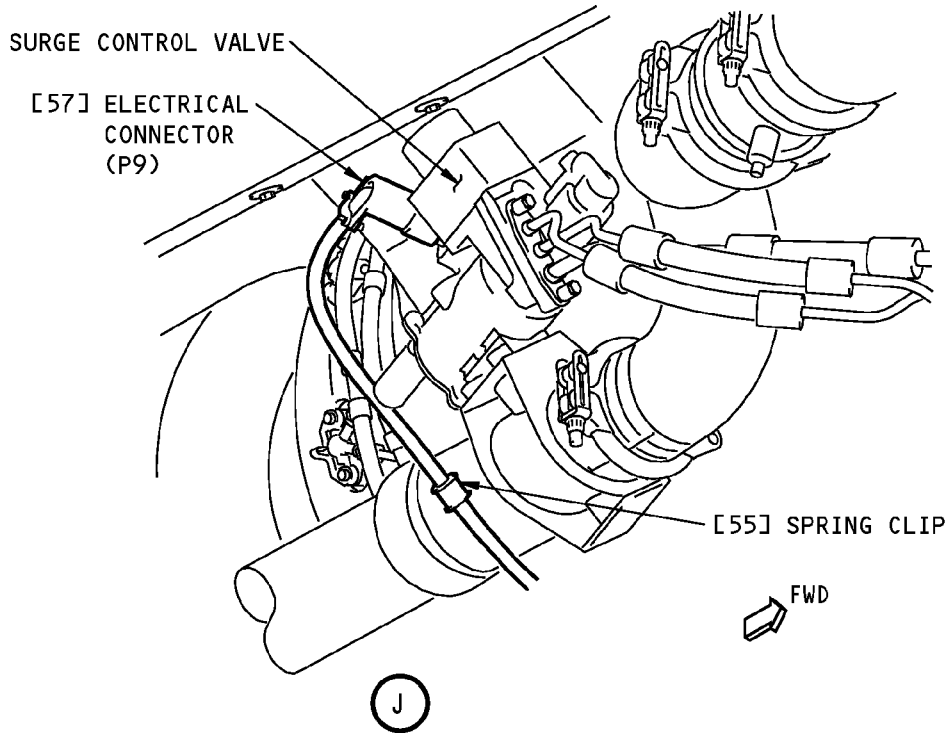
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TASK 49-11-01-400-802

## 5. Engine Wire Harness Installation

(Figure 402)

### A. References

Reference	Title
49-11-00-710-801	APU Operational Test (P/B 501)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

### B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
25	Engine wire harness	49-11-01-01-005	HAP 001-013, 015-026, 028-030
		49-11-01-02-005	HAP 031-054, 101-999

### C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

### D. Access Panels

Number	Name/Location
315A	APU Cowl Door

### E. Procedure

SUBTASK 49-11-01-420-002

- (1) Do these steps to install the engine wire harness [25]:
  - (a) Remove the caps from the electrical connectors.
  - (b) Connect the three electrical connectors [21], [22], [23] to the APU firewall receptacles on the 1088 bulkhead:
    - 1) Connect the electrical connector D10434 (P3) [23].
    - 2) Connect the electrical connector D10912 (P1) [22].
    - 3) Connect the electrical connector D10436 (P2) [21].
  - (c) Connect the electrical connector (P22) [24] to the fuel control unit.
  - (d) Put the engine wire harness [25] into the quick-release clamp [27].
 

**NOTE:** Grommets are installed on the engine wire harness to correctly position the engine wire harness on the quick-release clamps and spring clips.

    - 1) Close the quick-release clamp [27].
  - (e) Connect the electrical connector (P15) [30] to the oil temperature sensor.
  - (f) Connect the electrical connector (P14) [31] to the low oil pressure switch.
  - (g) Put the engine wire harness [25] into the two spring clips [29].
  - (h) Connect the electrical connector (P24) [28] to the filter bypass switch (oil filter indicator on the generator filter housing).
  - (i) Put the engine wire harness [25] into the two quick-release clamps [26].

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- 1) Close the two quick-release clamps [26].
- (j) Put the engine wire harness [25] into the spring clip [33].
- (k) Connect the electrical connector (P16) [32] to the oil level sensor.
- (l) Connect the electrical connector (P11) [34] to the data memory module.
- (m) Put the engine wire harness [25] into the seven spring clips [37], [36], [35], [46], [45], [49].
- (n) Connect the electrical connector (P17) [47] to the inlet guide vane (IGV) actuator.
- (o) Connect the electrical connector (P12) [44] to the speed sensor.
- (p) Connect the electrical connector (P18) [43] to the inlet pressure sensor.
- (q) Connect the electrical connector (P10) [48] to the bleed air valve.
- (r) Put the engine wire harness [25] into the spring clip [38].
- (s) Connect the electrical connector (P19) [42] to the total pressure sensor.
- (t) Connect the electrical connector (P20) [41] to the delta pressure sensor.
- (u) Connect the electrical connector (P21) [40] to the inlet temperature sensor.
- (v) Put the engine wire harness [25] into the two spring clips [39], [49].
- (w) Connect the electrical connector (P23) [50] to the flow divider solenoid for the fuel flow divider.
- (x) Put the engine wire harness [25] into the two spring clips [56], [55].
- (y) Connect the electrical connector (P9) [57] to the surge control valve.
- (z) Put the engine wire harness [25] into the three spring clips [54], [53], [52].
- (aa) Connect the four exhaust gas temperature (EGT) leads [59], [61]:
  - 1) Connect the two EGT leads [61] to the EGT thermocouple 1.

NOTE: The alumel stud on the EGT thermocouple 1 is larger than the chromel stud. Make sure the two EGT leads are connected to the correct studs.
  - 2) Install the two nuts [60] that attach the two EGT leads [61] to the EGT thermocouple 1.

NOTE: There are two different nuts that attach the two EGT leads to the EGT thermocouple 1. The nut for the alumel stud is larger than the nut for the chromel stud.

    - a) Tighten the nut [60] for the alumel stud to 24-40 pound-inches (2.7-4.5 newton-meters).
    - b) Tighten the nut [60] for the chromel stud to 15-20 pound-inches (1.7-2.3 newton-meters).
  - 3) Connect the two EGT leads [59] to the EGT thermocouple 2.

NOTE: The alumel stud on the EGT thermocouple 2 is larger than the chromel stud. Make sure the two EGT leads are connected to the correct studs.
  - 4) Install the two nuts [58] that attach the two EGT leads [59] to the EGT thermocouple 2.

NOTE: There are two different nuts that attach the two EGT leads to the EGT thermocouple 2. The nut for the alumel stud is larger than the nut for the chromel stud.

    - a) Tighten the nut [58] for the alumel stud to 24-40 pound-inches (2.7-4.5 newton-meters).
    - b) Tighten the nut [58] for the chromel stud to 15-20 pound-inches (1.7-2.3 newton-meters).

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(ab) Connect the electrical connector (P13) [51] to the ignition unit.

F. Engine Wire Harness Installation Test

SUBTASK 49-11-01-860-008

(1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-01-860-009

(2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-11-01-710-002

(3) Do this task: APU Operational Test, TASK 49-11-00-710-801.

SUBTASK 49-11-01-740-002

(4) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

(a) If maintenance message(s) show, refer to the applicable Maintenance Message Index in the FIM.

SUBTASK 49-11-01-860-010

(5) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-01-410-002

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— END OF TASK —————

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# AIRCRAFT MAINTENANCE MANUAL

## WIRE HARNESS - INSPECTION/CHECK

### 1. General

A. This procedure has these tasks:

- (1) An inspection of the APU and airplane wire harnesses
- (2) An inspection of the electrical connectors and terminals.

B. The APU has two wire harnesses. The starter-generator wire harness is installed on the starter-generator and the 1088 bulkhead. The engine wire harness is installed on the APU and the 1088 bulkhead.

### **TASK 49-11-01-200-801**

### 2. Wire Harness Inspection

A. References

Reference	Title
49-11-01-000-801	Starter-Generator Wire Harness Removal (P/B 401)
49-11-01-000-802	Engine Wire Harness Removal (P/B 401)
49-11-01-400-801	Starter-Generator Wire Harness Installation (P/B 401)
49-11-01-400-802	Engine Wire Harness Installation (P/B 401)
SWPM 20-10-13	Standard Wiring Practices Manual

B. Location Zones

Zone	Area
118	Electrical and Electronics Compartment - Right
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right
142	Aft Cargo Compartment - Right
314	Stabilizer Torsion Box Compartment - Right
315	APU Compartment - Left
316	APU Compartment - Right

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
311BL	Stabilizer Trim Access Door
315A	APU Cowl Door
821	Forward Cargo Door
822	Aft Cargo Door

D. Prepare for the Inspection

SUBTASK 49-11-01-010-003

(1) Do these steps to get access to the four terminal lugs on the starter-generator, starter-generator wire harness and engine wire harness:

- (a) Open the three latches on the APU Cowl Door, 315A
- (b) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

SUBTASK 49-11-01-010-004

- (2) To get access to the airplane wire harness for the air inlet door actuator and door position switch.

- (a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

SUBTASK 49-11-01-010-005

- (3) To get access to the airplane wire harness for the start converter unit, start power unit and battery, do this step:

- (a) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door
821	Forward Cargo Door

### HAP 001, 002, 006, 007 PRE SB 737-49-1116

- (b) Remove the left access panel in the forward cargo compartment to get access to the rear side of the start converter unit.

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- (c) Remove the bottom center access panel in the forward cargo compartment to get access to the rear side of the battery.

SUBTASK 49-11-01-010-006

- (4) To get access to the airplane wire harness for the electronic control unit, do this step:

- (a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
822	Aft Cargo Door

## E. Procedure

SUBTASK 49-11-01-210-001

- (1) Do these steps to inspect the APU and airplane wire harnesses:
  - (a) Examine the wire harnesses for disconnected and loose electrical connectors and terminal lugs.
    - 1) If you find a disconnected or loose electrical connector or terminal lug, connect or tighten the connector or terminal lug.
  - (b) Examine the wire harnesses for damaged insulation, shields and splices.

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- 1) If you find damage to the airplane wire harnesses, refer to the Standard Wiring Practices Manual to repair the problems that you find (SWPM 20-10-13).
- 2) If you find damage to the starter-generator wire harness on the APU, repair the problems that you find or replace the wire harness. These are the tasks:
  - Starter-Generator Wire Harness Removal, TASK 49-11-01-000-801
  - Starter-Generator Wire Harness Installation, TASK 49-11-01-400-801
- 3) If you find damage to the engine wire harness on the APU, repair the problems that you find or replace the wire harness. These are the tasks:
  - Engine Wire Harness Removal, TASK 49-11-01-000-802
  - Engine Wire Harness Installation, TASK 49-11-01-400-802

### F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-01-410-003

- (1) Do these steps after you examine the four terminal lugs on the starter-generator, starter-generator wire harness and engine wire harness:
  - (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
  - (b) Disconnect the two hold-open rods from the two brackets.
  - (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
  - (d) Install the retainer pin in the rod end of the forward hold-open rod.
  - (e) Install the retainer pin to the spring clip on the aft hold-open rod.
  - (f) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (g) Close the three latches.

SUBTASK 49-11-01-410-004

- (2) After you examine the airplane wire harness for the air inlet door actuator and door position switch, do this step:
  - (a) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

SUBTASK 49-11-01-410-005

- (3) Do these steps after you examine the airplane wire harness for the start converter unit, start power unit and battery:
  - (a) If the bottom center access panel was removed to get access to the rear side of the battery, install the access panel in the forward cargo compartment.

### HAP 001, 002, 006, 007 PRE SB 737-49-1116

- (b) If the left access panel was removed to get access to the rear side of the start converter unit, install the access panel in the forward cargo compartment.

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(c) Close these access panels:

Number	Name/Location
117A	Electronic Equipment Access Door
821	Forward Cargo Door

SUBTASK 49-11-01-410-006

(4) After you examine the airplane wire harness for the electronic control unit, do this step:

(a) Close this access panel:

Number	Name/Location
822	Aft Cargo Door

END OF TASK

TASK 49-11-01-200-802

3. Electrical Connector and Terminal Inspection

A. References

Reference	Title
49-11-01-960-801	Wire Harness Terminal Replacement (P/B 801)
49-11-01-960-802	Electrical Connector Contact Replacement (P/B 801)
49-11-01-960-803	Electrical Connector Replacement (P/B 801)
SWPM 20-60-01	Standard Wiring Practices Manual
SWPM 20-61-00	Standard Wiring Practices Manual

B. Location Zones

Zone	Area
118	Electrical and Electronics Compartment - Right
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right
142	Aft Cargo Compartment - Right
314	Stabilizer Torsion Box Compartment - Right
315	APU Compartment - Left
316	APU Compartment - Right

C. Procedure

SUBTASK 49-11-01-210-002

(1) Do these steps to inspect the electrical connector and terminal:

- (a) Examine the electrical connector or terminal that you disconnected for contamination and damage.
  - 1) If the electrical connector or terminal has contamination, then clean the connector or terminal (SWPM 20-60-01).
  - 2) If the engine or airplane wire harness has a damaged terminal, do this task: Wire Harness Terminal Replacement, TASK 49-11-01-960-801.
  - 3) If the electrical connector on the APU harness has a bent or pushed pin, do this task: Electrical Connector Contact Replacement, TASK 49-11-01-960-802.
  - 4) If the electrical connector on the airplane wire harness has a bent or pushed pin, replace the electrical connector contact (SWPM 20-61-00).

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- 5) If the electrical connector on the APU harness has damage and needs to be replaced, do this task: Electrical Connector Replacement, TASK 49-11-01-960-803.
  - 6) If the electrical connector on the airplane wire harness has damage, refer to the Standard Wiring Practices Manual to repair the problems that you find or replace the connector.
- (b) Examine the contact socket on the electrical plug or the receptacle for contamination and retention:
- 1) If the contact socket has contamination, then clean the socket (SWPM 20-60-01).
  - 2) Put a new pin into the contact socket to check if there is retention.
  - 3) If there is no retention between the new pin and contact socket, refer to the Standard Wiring Practices Manual to replace the used pin and/or contact socket.

————— **END OF TASK** —————

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## APU HARNESS - REPAIRS

### 1. General

A. This procedure has these tasks for the repair of the APU harness:

- (1) Wire harness terminal replacement
- (2) Electrical connector contact replacement
- (3) Electrical connector replacement.

#### **TASK 49-11-01-300-801**

### 2. APU Harness Repair

A. Location Zones

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right

B. APU Harness Repair

SUBTASK 49-11-01-960-001

- (1) If the APU harness has a damaged terminal, do this task: Wire Harness Terminal Replacement, TASK 49-11-01-960-801.

SUBTASK 49-11-01-960-002

- (2) If the electrical connector on the APU harness has a bent or pushed pin, do this task: Electrical Connector Contact Replacement, TASK 49-11-01-960-802.

SUBTASK 49-11-01-960-003

- (3) If the electrical connector on the APU harness has damage and needs to be replaced, do this task: Electrical Connector Replacement, TASK 49-11-01-960-803.

————— **END OF TASK** —————

#### **TASK 49-11-01-960-801**

### 3. Wire Harness Terminal Replacement

(Figure 801)

A. Tools/Equipment

**NOTE:** When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1593	Kit - Crimp Tool, Electrical Connectors (Part #: 46988, Supplier: 00779, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: DMC1264, Supplier: 11851, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: G01P3, Supplier: 54443, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-2489	Cutter - Diagonal, Side-Cushioned

B. Procedure

SUBTASK 49-11-01-020-003

- (1) Do these steps to remove the damaged terminal from the wire harness:

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- (a) Disconnect the damaged terminal from the component.
- (b) Cut the wire near the damaged terminal with the side-cushioned diagonal cutter, STD-2489.

SUBTASK 49-11-01-420-003

- (2) Do these steps to install a new terminal on the wire harness:
  - (a) Remove 0.2-0.3 inch (5.1-7.6 mm) of insulation from the wire.
  - (b) Put the bare wire in the center of the new terminal.
  - (c) Use the crimp tool in the tool kit, COM-1593 to crimp the terminal.
  - (d) Pull back lightly on the wire to make sure the terminal is attached correctly.
  - (e) Connect the terminal to the component.

————— **END OF TASK** —————

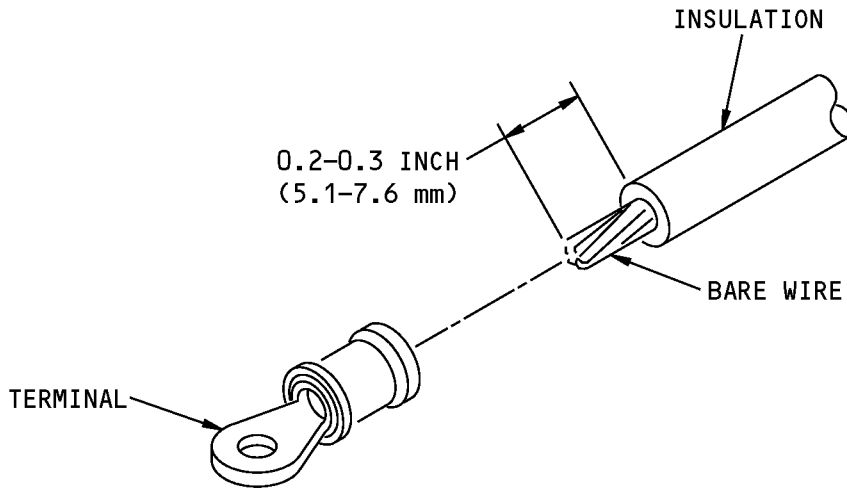
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**WIRE/TERMINAL CONNECTION**

**APU Harness Repair (Terminal)  
Figure 801/49-11-01-990-803**

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**TASK 49-11-01-960-802**

#### 4. Electrical Connector Contact Replacement

(Figure 802)

##### A. Tools/Equipment

**NOTE:** When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1593	Kit - Crimp Tool, Electrical Connectors (Part #: 46988, Supplier: 00779, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: DMC1264, Supplier: 11851, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: G01P3, Supplier: 54443, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

##### B. Consumable Materials

Reference	Description	Specification
G00150	Tape - Teflon Film With Silicon Adhesive, 5 mil - Permacel P-421	
G50225	Lockwire - Corrosion Resistant Steel, 0.020 inch diameter	NASM20995~ C20

##### C. Procedure

SUBTASK 49-11-01-020-004

- (1) Do these steps to remove the damaged electrical connector contact:
  - (a) Disconnect the electrical connector from the component.
  - (b) Remove the lockwire from the backshell.
  - (c) Loosen the saddle clamp and coupling collar from the electrical connector.
  - (d) Disconnect the backshell from the electrical connector.
  - (e) Remove the tape from the wires.
  - (f) Use the contact removal tool in the tool kit, COM-1593 to remove the damaged contact from the electrical connector.
  - (g) Cut the wire near the damaged contact.

SUBTASK 49-11-01-420-004

- (2) Do these steps to install a new electrical connector contact:
  - (a) Remove 0.125 inch (3.2 mm) of insulation from the end of the wire.
  - (b) Put the bare wire into the new contact until the bare wire touches the bottom barrel of the contact.
  - (c) Use the crimp tool in the tool kit, COM-1593 to crimp the contact.
  - (d) Use the contact insertion tool in the tool kit, COM-1593 to put the contact into the electrical connector.
  - (e) Pull back lightly on the wire to make sure the contact is attached correctly.
  - (f) Connect the backshell on the electrical connector.
  - (g) Tighten the coupling collar finger tight.

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- (h) Install the Permacel P-421 tape, G00150 around the wires that are in the saddle clamp area.
- (i) Tighten the saddle clamp on the backshell.
- (j) Install the lockwire, G50225 on the backshell.
- (k) Connect the electrical connector to the component.

————— **END OF TASK** —————

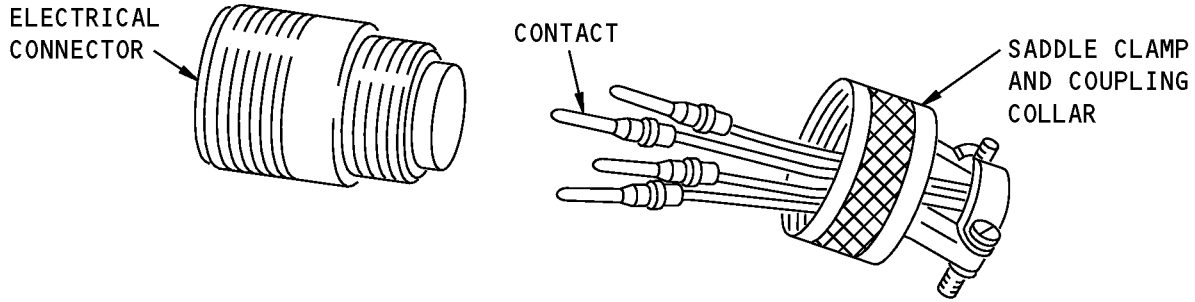
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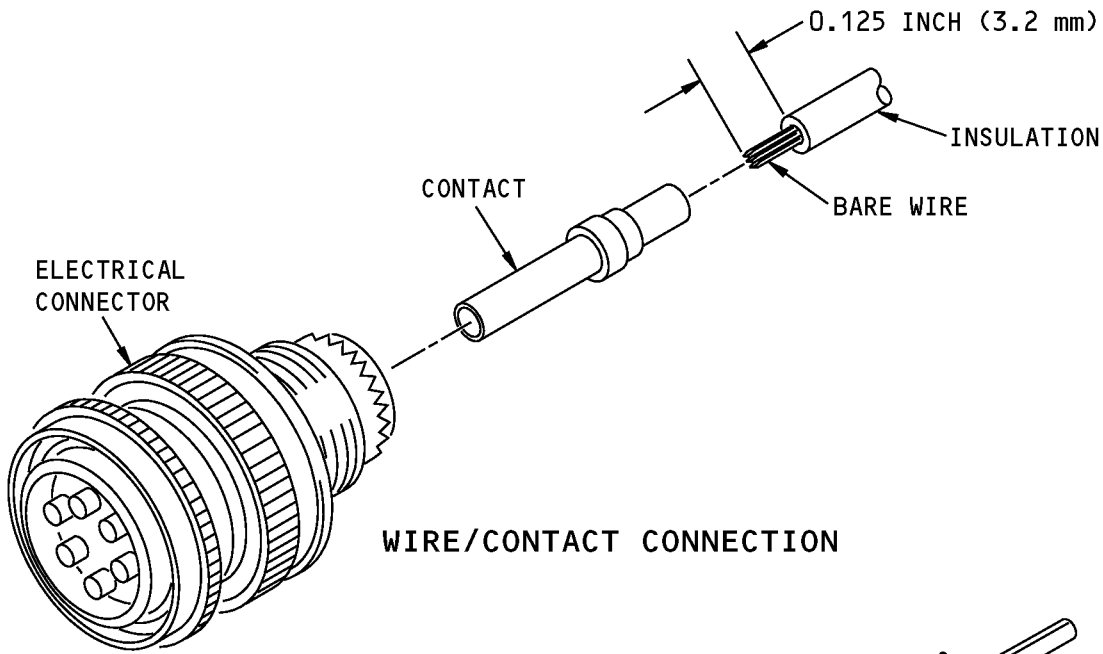
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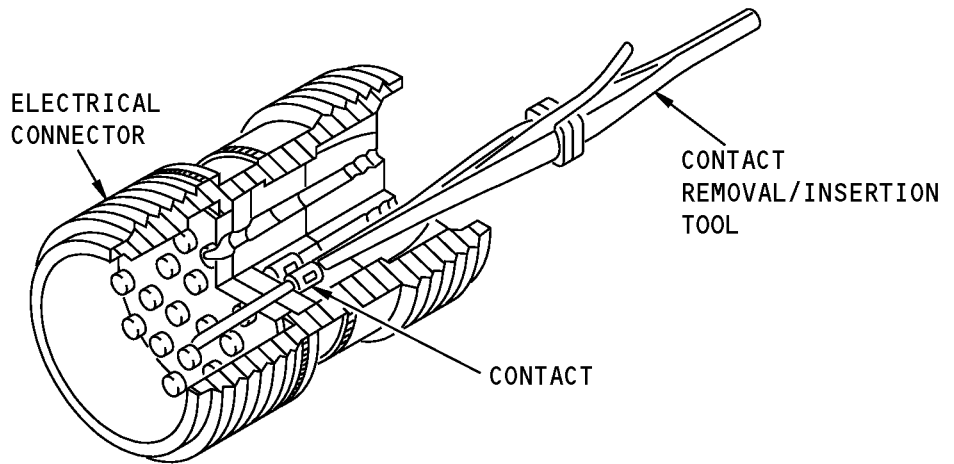
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**ELECTRICAL CONNECTOR COMPONENTS**



**WIRE/CONTACT CONNECTION**



**CONTACT INSTALLATION**

**APU Harness Repair (Electrical Connector)  
Figure 802/49-11-01-990-804**

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**TASK 49-11-01-960-803**

#### 5. Electrical Connector Replacement

(Figure 802)

##### A. Tools/Equipment

**NOTE:** When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1593	Kit - Crimp Tool, Electrical Connectors (Part #: 46988, Supplier: 00779, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: DMC1264, Supplier: 11851, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: G01P3, Supplier: 54443, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

##### B. Consumable Materials

Reference	Description	Specification
G00150	Tape - Teflon Film With Silicon Adhesive, 5 mil - Permacel P-421	
G50225	Lockwire - Corrosion Resistant Steel, 0.020 inch diameter	NASM20995~ C20

##### C. Procedure

SUBTASK 49-11-01-960-004

- (1) Do these steps to replace the damaged electrical connector:
  - (a) Disconnect the damaged electrical connector from the component.
  - (b) Remove the lockwire from the backshell.
  - (c) Loosen the saddle clamp and coupling collar from the electrical connector.
  - (d) Disconnect the backshell from the electrical connector.
  - (e) Remove the tape from the wires.
  - (f) Use the contact removal tool in the tool kit, COM-1593 to remove one contact from the damaged electrical connector.
  - (g) Use the contact insertion tool to install the contact in the new electrical connector at the correct pin location.
  - (h) Pull back lightly on the wire to make sure the contact is attached correctly.
  - (i) Continue to remove one contact from the damaged electrical connector and install the contact to the new electrical connector until all contacts are installed on the new connector.
  - (j) Connect the backshell on the new electrical connector.
  - (k) Tighten the coupling collar finger tight.
  - (l) Install the Permacel P-421 tape, G00150 around the wires that are in the saddle clamp area.
  - (m) Tighten the saddle clamp on the backshell.
  - (n) Install the lockwire, G50225 on the backshell.
  - (o) Connect the electrical connector to the component.

————— **END OF TASK** —————

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# AIRCRAFT MAINTENANCE MANUAL

## APU SYSTEM - MAINTENANCE PRACTICES

### 1. General

A. This procedure has these tasks:

- (1) APU system deactivation
- (2) APU system activation.

B. The removal of the APU system decreases the weight of the airplane. Refer to the Weight and Balance Manual to correct the operational characteristics for the airplane.

#### **TASK 49-11-02-040-801**

### 2. APU System Deactivation

(Figure 201)

A. References

Reference	Title
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
49-11-00-000-801	APU Power Plant Removal (P/B 401)

B. Tools/Equipment

**NOTE:** When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1971	Protector - Thread, APU Mount Bolt (Part #: C49006-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

C. Consumable Materials

Reference	Description	Specification
D00070	Fluid - Hydraulic, Petroleum Base	MIL-PRF-5606 (Replaces MIL-H-5606)
D00504	Grease - Petrolatum	VV-P-236

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right
315	APU Compartment - Left
316	APU Compartment - Right

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door
315A	APU Cowl Door

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#### F. Prepare for the Deactivation

SUBTASK 49-11-02-710-001

- (1) Do these steps to do an operational check of the APU air inlet door:
  - (a) Make sure the BAT switch [1] on the P5 forward overhead panel is ON.
  - (b) Set the APU master switch [6] on the P5 forward overhead panel to the ON position.
  - (c) Make sure the air inlet door opens in approximately 30 seconds.
  - (d) Set the APU master switch [6] to the OFF position and install an INOP tag [5].
  - (e) Make sure the air inlet door closes in approximately 30 seconds.

SUBTASK 49-11-02-860-001

**WARNING:** MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Make sure the downlock pins are installed in the nose and main landing gear (Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801).

SUBTASK 49-11-02-010-001

- (3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

#### G. APU System Deactivation

SUBTASK 49-11-02-860-002

- (1) Set the two APU GEN switches [4] on the P5 forward overhead panel to the OFF position and install two INOP tags [7].

SUBTASK 49-11-02-860-003

- (2) Set the APU BLEED switch [3] on the P5 forward overhead panel to the OFF position and install an INOP tag [2].

SUBTASK 49-11-02-860-004

- (3) Open these circuit breakers and attach the four collars and four INOP tags:

These are the circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT
B	14	C01424	AUX POWER UNIT SCU FAN POWER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

SUBTASK 49-11-02-040-001

- (4) Do these steps for the APU fuel shutoff valve deactivation:

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- (a) Get access to the APU fuel shutoff valve [10].

NOTE: The APU fuel shutoff valve [10] is on the rear spar of the left wing in the wheel well.

- (b) Make sure the APU fuel shutoff valve [10] is fully closed.

NOTE: The manual override handle [8] on the APU fuel shutoff valve [10] gives an OPEN or CLOSED indication of the shutoff valve position.

- 1) If the APU fuel shutoff valve [10] is not fully closed, set the manual override handle [8] to the CLOSED position.

- (c) Disconnect the electrical connector, D920 [9] from the APU fuel shutoff valve [10].

- (d) Install the protection covers on the electrical connector, D920 [9] and the valve receptacle.

- (e) Attach the airplane harness to an adjacent support structure.

SUBTASK 49-11-02-040-002

- (5) Do these steps for the inlet door actuator deactivation:

- (a) Disconnect the electrical connector, D922 [12] from the inlet door actuator [11].

NOTE: The inlet door actuator [11] is installed aft of the rear pressure bulkhead on the inner side of the air inlet door.

- (b) Install the cap chains on the electrical connector, D922 [12] and the actuator receptacle.

- (c) Attach the airplane harness to an adjacent support structure.

SUBTASK 49-11-02-020-001

- (6) Do this task: APU Power Plant Removal, TASK 49-11-00-000-801.

SUBTASK 49-11-02-480-001

- (7) Do these steps to install the APU deletion kit, C49009-1:

NOTE: The APU deletion kit, C49009-1, has these parts:

- 1) 660-022M28N, protection cover (Quantity of 3)
- 2) C49009-2, support frame
- 3) C49009-3, plug for the exhaust duct muffler
- 4) C49009-4, plug for the bleed duct assembly
- 5) M83723/60-1-24AN, protection cover
- 6) MS21921-8, plug for the fuel supply line
- 7) NASM21042-6, nut (Quantity of 6)
- 9) NAS1297-3D12, bolt
- 10) NAS509-3, nut.

- (a) Remove the caps and install the three protection covers on the electrical receptacles for the electrical connectors D10912 (P1), D10436 (P2) and D10434 (P3).

- (b) Remove the cap and install the protection cover on the electrical receptacle for the electrical connector D11118 (P4).

- (c) Do these steps to install the plug [13] on the fuel supply line [14]:

- 1) Remove the cap or plug from the fuel supply line [14].

- 2) Lubricate the plug [13] with a light coat of the lubricant, grease, D00504 or fluid, D00070

- 3) Install the plug [13] on the fuel supply line [14].

- (d) Do these steps to install the plug [18] on the bleed duct assembly [15]:

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- 1) Remove the protection cover from the bleed duct assembly [15].
- 2) Install the seal [16] on the bleed duct assembly [15].  
NOTE: The seal [16] is a part of the bleed air duct.
- 3) Install the plug [18] on the bleed duct assembly [15].
- 4) Put the clamp [17] over the plug [18] and the flange of the bleed duct assembly [15].  
NOTE: The clamp [17] is a part of the bleed air duct.
  - a) Tighten the clamp [17] to 95-110 inch-pounds (10.6-12.4 newton-meters).
- (e) Do these steps to install the support frame [37] to the left forward mount [19], left aft mount [24], right forward mount [30] and right aft mount [28]:
  - 1) Remove the protector, SPL-1971 from the three cone bolts [31] on the left aft mount [24], right forward mount [30] and right aft mount [28].
  - 2) Put the support frame [37] in its position.
  - 3) Install the support frame [37] on the three cone bolts [31] for the left aft mount [24], right forward mount [30] and right aft mount [28] with the three washers [32] and three nuts [33].  
NOTE: The three washers [32] and three nuts [33] are parts of the APU mount system.
    - a) Tighten the three nuts [33] to 375-425 pound-inches (42.4-48.0 newton-meters).
  - 4) Remove the nut [22], two washers [21] and bolt [20] from the left forward mount [19].
  - 5) Make sure the bushing [23] is installed in the left forward mount [19].
  - 6) Install the support frame [37] to the left forward mount [19] with the bolt [20], two washers [21] and nut [22].
- (f) Do these steps to connect the four terminal lugs [35] for the starter-generator to the terminal board [36]:
  - 1) Install the four terminal lugs [35] to the four terminal studs on the terminal board [36] with the four nuts [34].  
NOTE: The four nuts [34] are parts of the APU deletion kit, C49009-1.
- (g) Connect the bonding jumper [29] to the support frame [37] with the two nuts [34].  
NOTE: The two nuts [34] are parts of the APU deletion kit, C49009-1.
- (h) Do these steps to install the plug [40] on the exhaust duct muffler [38]:
  - 1) Install the plug [40] on the exhaust duct muffler [38].
  - 2) Put the clamp [39] over the plug [40] and exhaust duct muffler [38].  
NOTE: The clamp [39] is a part of the exhaust duct muffler [38].
    - a) Tighten the clamp [39] to 70-90 pound-inches (7.9-10.2 newton-meters).
- (i) Do these steps to connect the turnbuckle [27] to the support frame [37]:
  - 1) Align the hole of the turnbuckle [27] to the support frame [27].
  - 2) If the holes of the support frame [37] and the turnbuckle [27] do not align, adjust the turnbuckle [27]:
    - a) Turn the adjustment nuts on the turnbuckle [27] clockwise or counterclockwise until the holes of the turnbuckle [27] and the support frame [37] are aligned.
  - 3) Install the bolt [25] and nut [26] that attach the turnbuckle [27] to the support frame [37].  
NOTE: The bolt [25] and nut [26] are parts of the APU deletion kit, C49009-1.

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### H. Put the Airplane Back to its Usual Condition

SUBTASK 49-11-02-410-001

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

SUBTASK 49-11-02-410-002

(2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

SUBTASK 49-11-02-210-001

(3) Do a general visual inspection of the APU compartment after the first flight and then every 100 hours until you do the APU system activation procedure.

————— **END OF TASK** —————

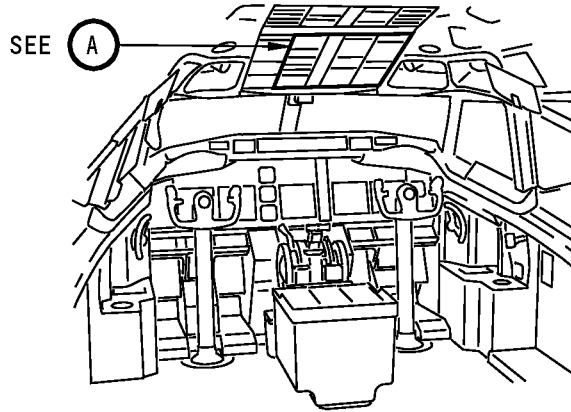
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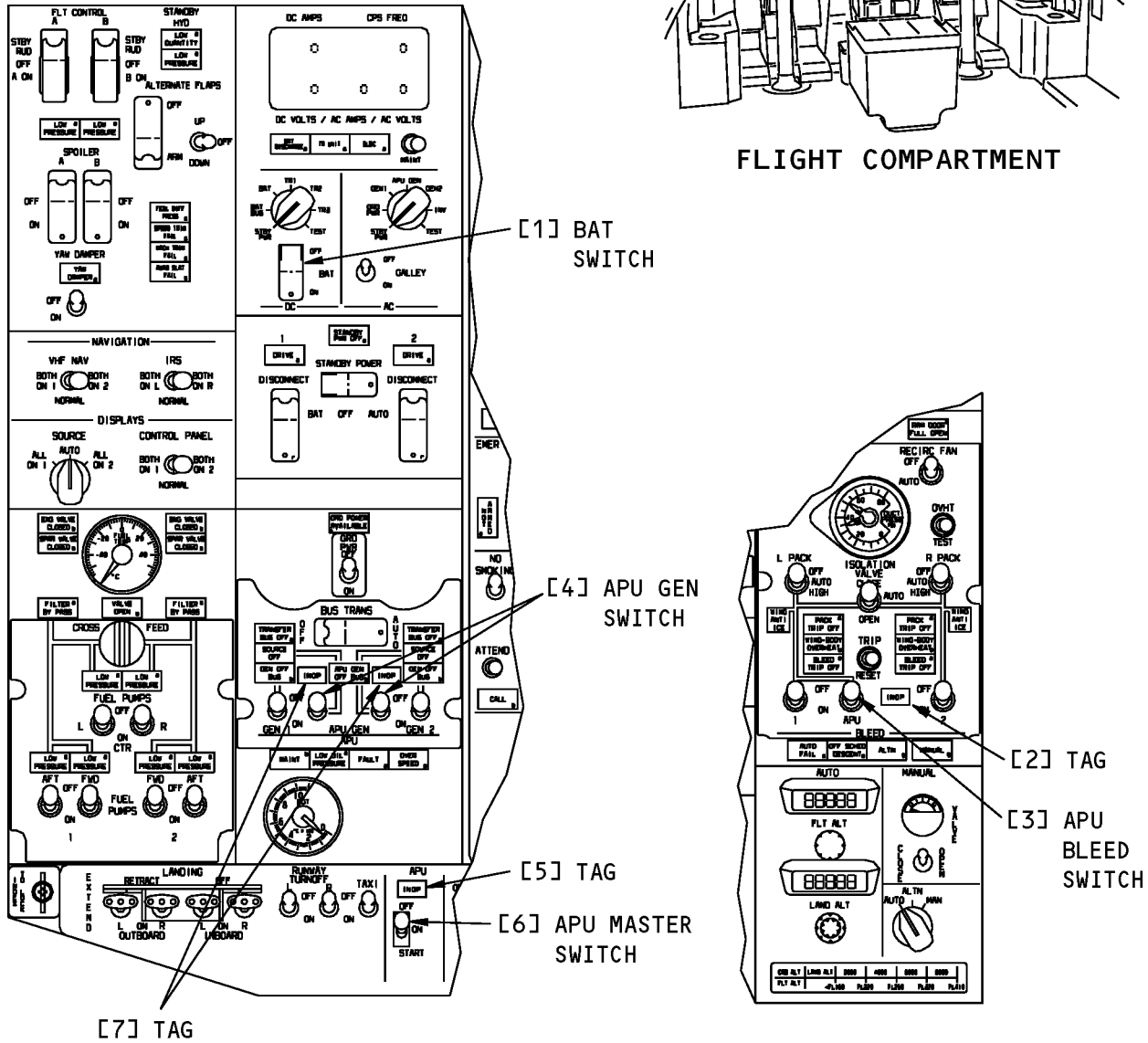
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**FLIGHT COMPARTMENT**



**FORWARD OVERHEAD PANEL, P5**



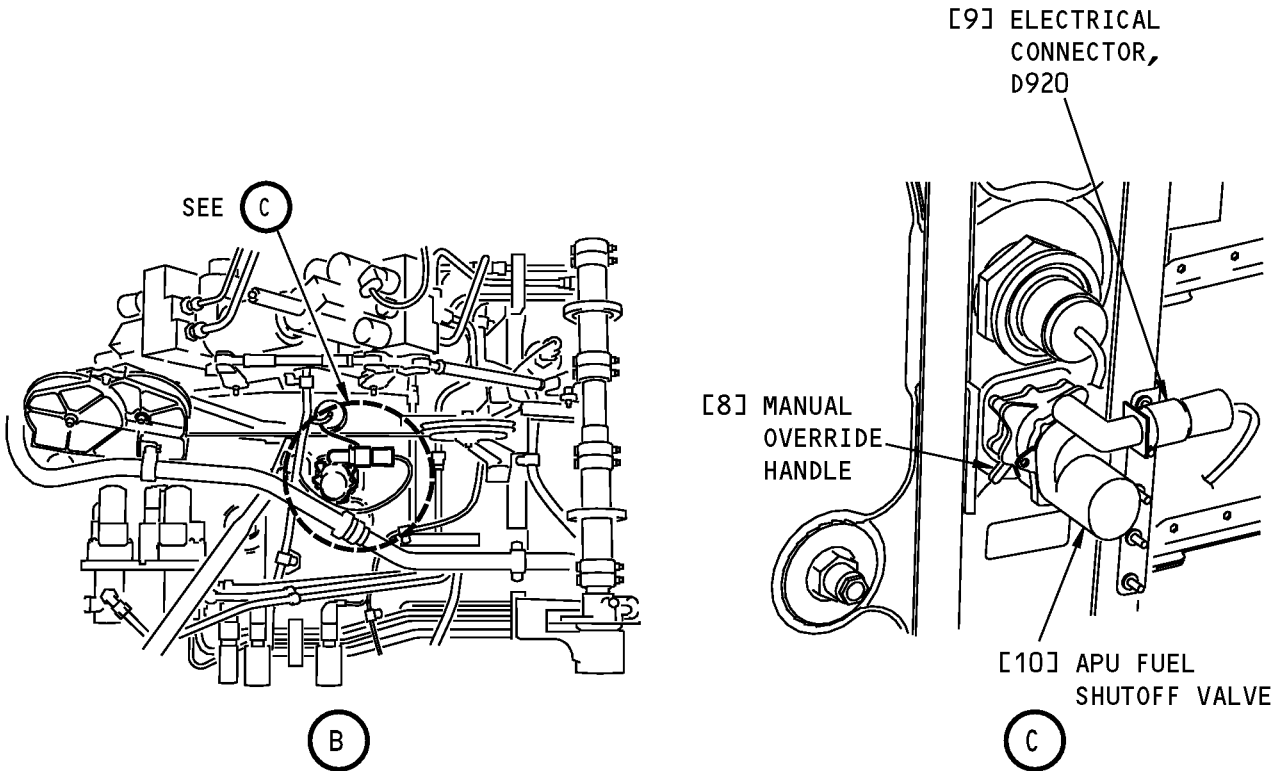
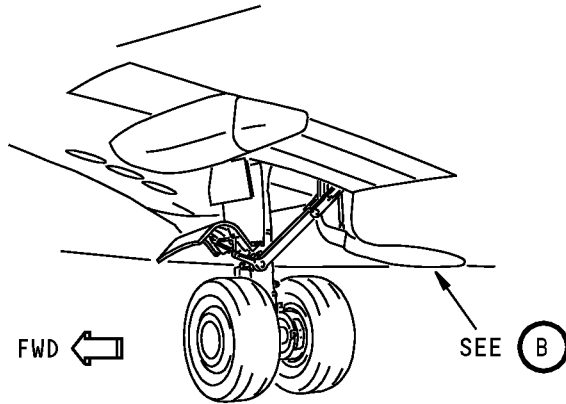
**Auxiliary Power Unit (APU) System Deactivation  
Figure 201 (Sheet 1 of 5)/49-11-02-990-801**

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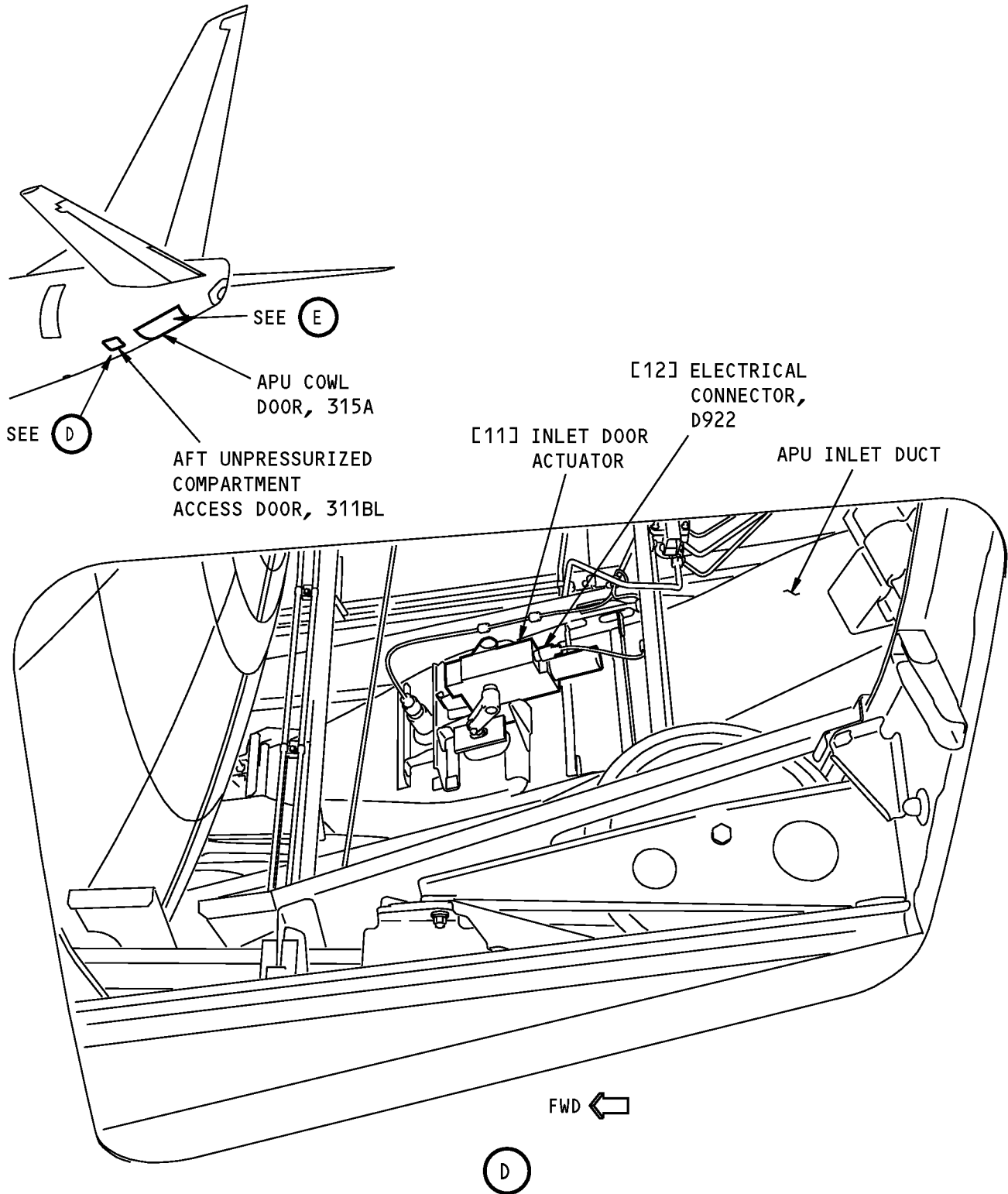
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**Auxiliary Power Unit (APU) System Deactivation  
Figure 201 (Sheet 2 of 5)/49-11-02-990-801**

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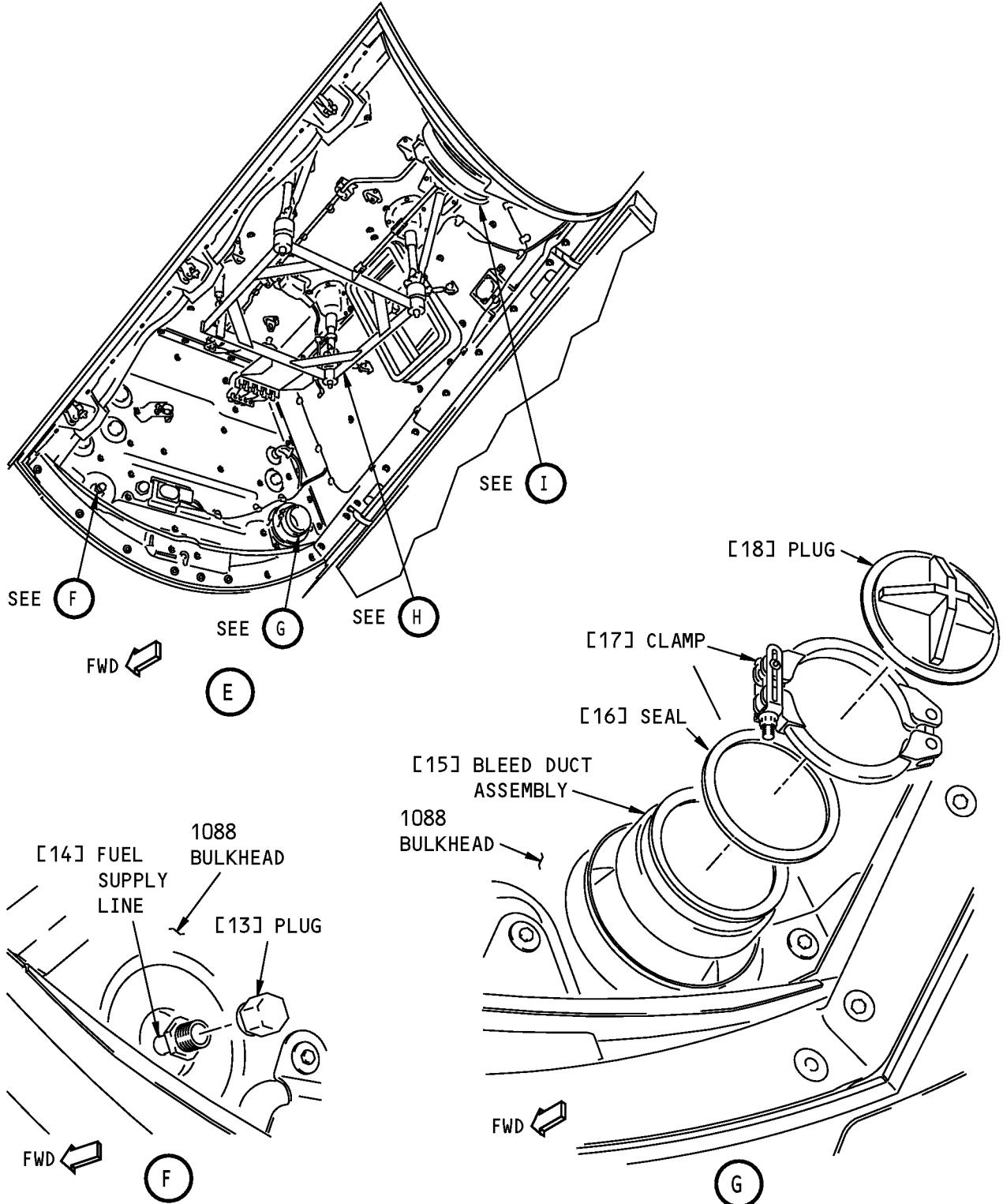
**Auxiliary Power Unit (APU) System Deactivation  
Figure 201 (Sheet 3 of 5)/49-11-02-990-801**

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**Auxiliary Power Unit (APU) System Deactivation**  
**Figure 201 (Sheet 4 of 5)/49-11-02-990-801**

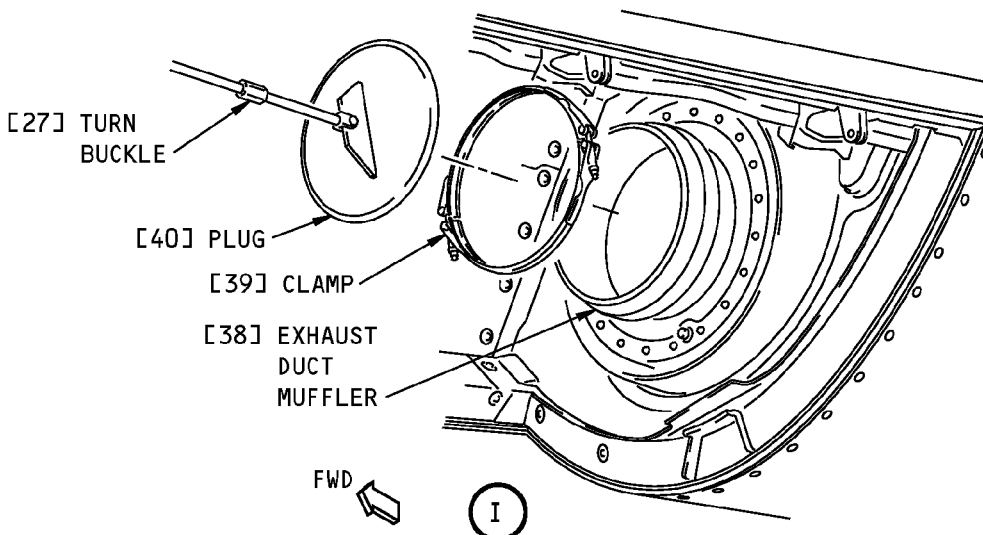
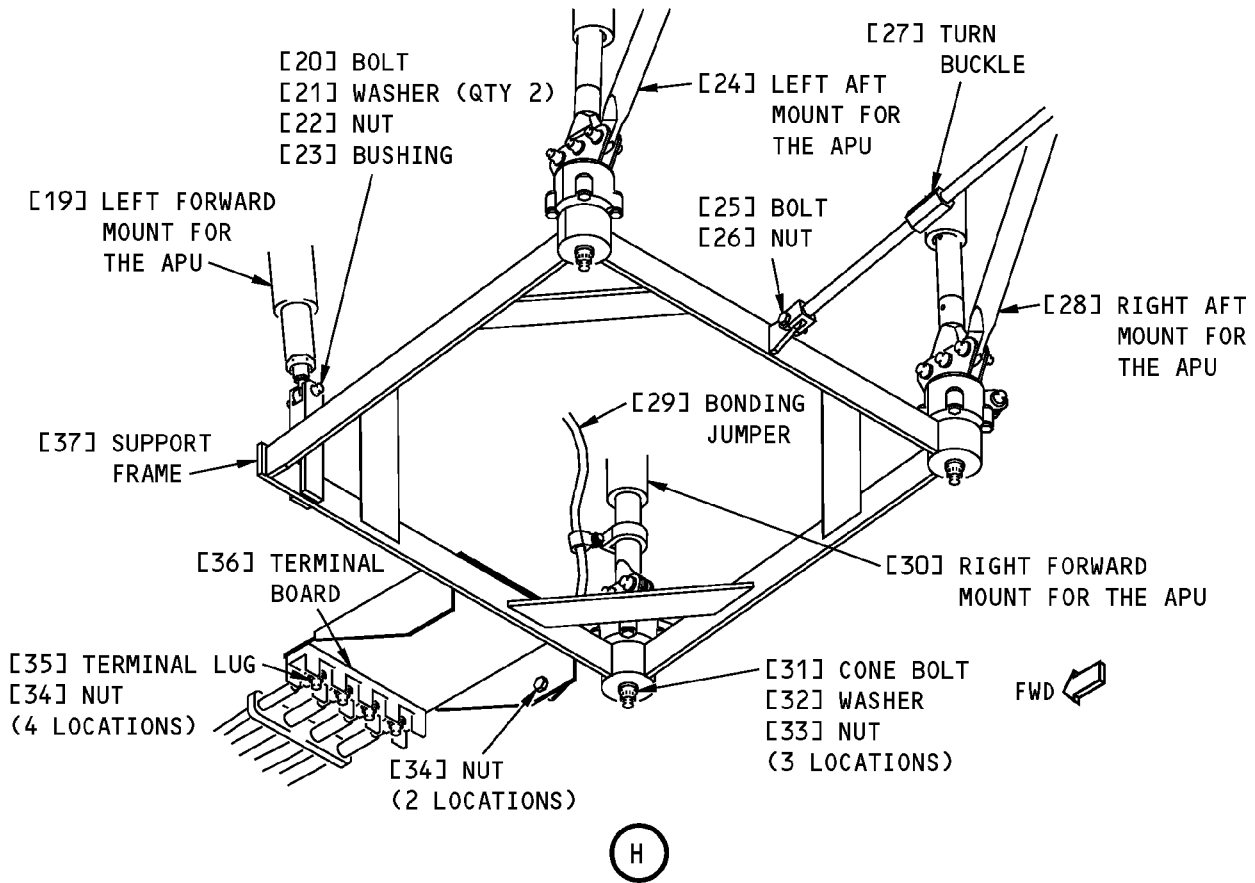
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**Auxiliary Power Unit (APU) System Deactivation  
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TASK 49-11-02-440-801

#### 3. APU System Activation

(Figure 201)

##### A. References

Reference	Title
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
49-11-00-400-801	APU Power Plant Installation (P/B 401)

##### B. Tools/Equipment

**NOTE:** When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1971	Protector - Thread, APU Mount Bolt (Part #: C49006-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

##### C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right
315	APU Compartment - Left
316	APU Compartment - Right

##### D. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door
315A	APU Cowl Door

##### E. Prepare for the Activation

SUBTASK 49-11-02-860-005

**WARNING:** MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Make sure the downlock pins are installed in the nose and main landing gear (Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801).

SUBTASK 49-11-02-010-002

- (2) Open this access panel:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 49-11-02-010-003

- (3) To open the access panel, do these steps

Number	Name/Location
315A	APU Cowl Door

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- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### F. APU System Activation

SUBTASK 49-11-02-860-006

- (1) Remove the four INOP tags [2], [5] and [7] from these switches at the P5 forward overhead panel:
  - (a) APU BLEED switch [3]
  - (b) APU master switch [6]
  - (c) Two APU GEN switches [4].

SUBTASK 49-11-02-860-007

- (2) Make sure the APU master switch [6] on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-11-02-420-001

- (3) Remove the protection covers and connect the electrical connector, D920 [9] to the APU fuel shutoff valve [10].

NOTE: The APU fuel shutoff valve [10] is on the rear spar of the left wing in the wheel well.

SUBTASK 49-11-02-420-002

- (4) Remove the cap chains and connect the electrical connector, D922 [12] to the inlet door actuator [11].

NOTE: The inlet door actuator [11] is installed aft of the rear pressure bulkhead on the inner side of the air inlet door.

SUBTASK 49-11-02-080-001

- (5) Do these steps to remove the APU deletion kit, C49009-1:

NOTE: The APU deletion kit, C49009-1, has these parts:

- 1) 660-022M28N, protection cover (Quantity of 3)
- 2) C49009-2, support frame
- 3) C49009-3, plug for the exhaust duct muffler
- 4) C49009-4, plug for the bleed duct assembly
- 5) M83723/60-1-24AN, protection cover
- 6) MS21921-8, plug for the fuel supply line
- 7) NASM21042-6, nut (Quantity of 6)
- 9) NAS1297-3D12, bolt
- 10) NAS509-3, nut.

- (a) Remove the nut [26] and bolt [25] that attach the turnbuckle [27] to the support frame [37].
- (b) Do these steps to remove the plug [40] from the exhaust duct muffler [38]:

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1) Remove the clamp [39] from the exhaust duct muffler [38].

NOTE: The clamp [39] is a part of the exhaust duct muffler [38].

2) Remove the plug [40].

(c) Remove the two nuts [34] that attach the bonding jumper [29] to the support frame [37].

(d) Remove the four nuts [34] that attach the four terminal lugs [35] for the starter-generator to the terminal board [36].

(e) Do these steps to remove the support frame [37] from the left forward mount [19], left aft mount [24], right forward mount [30] and right aft mount [28]:

1) Remove the nut [22], two washers [21] and bolt [20] from the left forward mount [19].

2) Disconnect the support frame [37] from the left forward mount [19].

3) Make sure the bushing [23] is installed in the left forward mount [19].

4) Install the bolt [20], two washers [21] and nut [22] on the left forward mount [19].

5) Remove the three nuts [33] and three washers [32] that attach the support frame [37] to the left aft mount [24], right forward mount [30] and right aft mount [28].

NOTE: The three washers [32] and three nuts [33] are parts of the APU mount system.

6) Remove the support frame [37].

**WARNING:** MAKE SURE THE THREAD PROTECTORS ARE FULLY ENGAGED ON THE CONE BOLTS. IF THE THREAD PROTECTORS ARE NOT FULLY ENGAGED, THE APU BRACKETS CAN GET CAUGHT ON THE THREAD PROTECTOR. THIS CAN CAUSE THE APU TO MOVE SUDDENLY. A SUDDEN MOVEMENT OF THE APU CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

7) Install the protector, SPL-1971 on the three cone bolts [31].

(f) Do these steps to remove the plug [18] from the bleed duct assembly [15]:

1) Remove the clamp [17] from the bleed duct assembly [15].

NOTE: The clamp [17] is a part of the bleed air duct.

2) Remove the plug [17].

3) Remove the seal [16] from the bleed duct assembly [15].

NOTE: The seal [16] is a part of the bleed air duct.

SUBTASK 49-11-02-420-003

(6) Do this task: APU Power Plant Installation, TASK 49-11-00-400-801.

NOTE: During the APU power plant installation, the four protection covers for the electrical receptacles and plug [13] for the fuel supply line [14] are removed.

SUBTASK 49-11-02-860-008

(7) During the APU installation test, do this step:

(a) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT
B	14	C01424	AUX POWER UNIT SCU FAN POWER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

**G. Put the Airplane Back to its Usual Condition**

SUBTASK 49-11-02-410-003

(1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

————— **END OF TASK** —————

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# AIRCRAFT MAINTENANCE MANUAL

## APU MOUNTS - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the APU mounts
- (2) An installation of the APU mounts.

B. There are four APU mounts installed on the top of the section 48 compartment. You can remove one or more APU mounts independently from each other.

#### **TASK 49-13-11-000-802**

### 2. APU Mounts Removal

(Figure 401)

A. References

Reference	Title
49-11-00-000-801	APU Power Plant Removal (P/B 401)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. Prepare for the Removal

SUBTASK 49-13-11-010-002

- (1) Remove the APU. To remove it, do this task: APU Power Plant Removal, TASK 49-11-00-000-801.

D. APU Mount Removal

SUBTASK 49-13-11-020-002

- (1) Do these steps to remove the left forward mount [1] for the APU:
  - (a) Remove the seven screws [12] and seven washers [11] that attach the firewall cover [5] and flameshield [10] to the top insulation panel.
 

NOTE: The firewall cover [5] is attached to the top insulation panel with sealant. The flameshield [10] is attached to the firewall cover [5] with sealant.
  - (b) Move the firewall cover [5] down until you can get access to the top end of the left forward mount [1].
  - (c) Remove the nut [9], two washers [7], bushing [8] and bolt [6] that attach the left forward mount [1] to the support bracket.
  - (d) Remove the left forward mount [1] and firewall cover [5].
  - (e) If it is necessary, remove the firewall cover [5] from the left forward mount [1].

NOTE: It is not necessary to remove the firewall cover [5] if the left forward mount [1] is satisfactory.

SUBTASK 49-13-11-020-003

- (2) Do these steps to remove the left aft mount for the APU [2]:

NOTE: The left aft mount for the APU [2] has the forward strut assembly [22], aft strut assembly [28] and vibration isolator [27].

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- (a) Remove the five screws [21] and five washers [20] that attach the forward firewall cover [19] to the top insulation panel.

NOTE: The forward firewall cover [19] and aft firewall cover [29] are attached to the top insulation panel with sealant.

- (b) Remove the five screws [13] and five washers [14] that attach the aft firewall cover [29] to the top insulation panel.
- (c) Move the forward firewall cover [19] and aft firewall cover [29] down until you can get access to the two top ends of the left aft mount [2].
- (d) Remove the two nuts [18], four washers [17], two bushings [16] and two bolts [15] that attach the left aft mount [2] to the two support brackets.
- (e) Remove the left aft mount [2], forward firewall cover [19] and aft firewall cover [29].
- (f) If it is necessary, remove the forward firewall cover [19] and aft firewall cover [29] from the left aft mount [2].

NOTE: It is not necessary to remove the forward firewall cover [19] and aft firewall cover [29] if the left aft mount is satisfactory.

- (g) If it is necessary to remove the vibration isolator [27], forward strut assembly [22] and/or aft strut assembly [28], then do these steps:

NOTE: It is necessary to remove the vibration isolator [27], forward strut assembly [22] and/or aft strut assembly [28] if you find signs of wear and damage that are more than the limits for the left aft mount.

- 1) Remove the three nuts [26], six washers [25], three bushings [24] and three bolts [23] that attach the vibration isolator [27] to the forward strut assembly [22] and/or aft strut assembly [28].
- 2) Remove the forward strut assembly [22] and/or aft strut assembly [28] from the vibration isolator [27].
- 3) Remove the vibration isolator [27].

SUBTASK 49-13-11-020-004

- (3) Do these steps to remove the right aft mount for the APU [3]:

NOTE: The right aft mount for the APU [3] has the aft strut assembly [40], side strut assembly [44], forward strut assembly [51] and vibration isolator [46].

- (a) Remove the two nuts [45], four washers [42], two bushings [43] and two bolts [41] that attach the side strut assembly [44] to the support bracket and vibration isolator [46].
- (b) Remove the side strut assembly [44].
- (c) Remove the five screws [30] and five washers [31] that attach the forward firewall cover [32] to the top insulation panel.

NOTE: The forward firewall cover [32] and aft firewall cover [39] are attached to the top insulation panel with sealant.

- (d) Remove the five screws [38] and five washers [37] that attach the aft firewall cover [39] to the top insulation panel.
- (e) Move the forward firewall cover [32] and aft firewall cover [39] down until you can get access to the two top ends of the right aft mount [3].
- (f) Remove the two nuts [33], four washers [35], two bushings [34] and two bolts [36] that attach the right aft mount [3] to the two support brackets.
- (g) Remove the right aft mount [3], forward firewall cover [32] and aft firewall cover [39].

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- (h) If it is necessary, remove the forward firewall cover [32] and aft firewall cover [39] from the right aft mount [3].

NOTE: It is not necessary to remove the forward firewall cover [32] and aft firewall cover [39] if the right aft mount is satisfactory.

- (i) If it is necessary to remove the aft strut assembly [40], forward strut assembly [51] and/or vibration isolator [46], then do these steps:

NOTE: It is necessary to remove the aft strut assembly [40], forward strut assembly [51] and vibration isolator [46] if you find signs of wear and damage that are more than the limits for the right aft mount.

- 1) Remove the three nuts [47], six washers [49], three bushings [48] and three bolts [50] that attach the vibration isolator [46] to the aft strut assembly [40] and forward strut assembly [51].
- 2) Remove the aft strut assembly [40] and forward strut assembly [51] from the vibration isolator [46].
- 3) Remove the vibration isolator [46].

SUBTASK 49-13-11-020-005

- (4) Do these steps to remove the right forward mount [4] for the APU:

- (a) Remove the two nuts [64], four washers [60], two bushings [62] and two bolts [61] that attach the side strut assembly [63] to the support bracket and vibration isolator [66].
- (b) Remove the side strut assembly [63].
- (c) Remove the nut [71], two washers [72] and screw [59] that attach the two clamps [70], [73] to the bonding jumper [78] and right forward mount [4].
- (d) Remove the two clamps [70], [73].
- (e) If it is necessary to remove the left firewall cover [79] for the bonding jumper, then do these steps:

NOTE: It is necessary to remove the left firewall cover [79] and the bonding jumper if you must remove the top insulation panel.

NOTE: The left firewall cover [79] and right firewall cover [58] are attached to the top insulation panel with sealant.

- 1) Remove the four screws [80] and four washers [81] that attach the left firewall cover [79] to the top insulation panel.
- 2) Move the left firewall cover [79] down until you can get access to the top end of the bonding jumper [78].
- 3) Remove the two nuts [74], four washers [75] and two bolts [76] that attach the bonding jumper [78] to the support bracket.

NOTE: The mounting parts and the lug for the bonding jumper are sealed with sealant.

- 4) Remove the bonding jumper [78] and left firewall cover [79].
- 5) If it is necessary, remove the left firewall cover [79] from the bonding jumper [78].

NOTE: It is not necessary to remove the left firewall cover [79] if the bonding jumper is satisfactory.

- (f) Remove the five screws [57] and five washers [56] that attach the right firewall cover [58] to the top insulation panel.

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- (g) Move the right firewall cover [58] down until you can get access to the top end of the right forward mount [4].
- (h) Remove the nut [52], two washers [54], bushing [53] and bolt [55] that attach the right forward mount [4] to the support bracket.
- (i) Remove the right forward mount [4] and right firewall cover [58].
- (j) If it is necessary, remove the right firewall cover [58] from the right forward mount [4].

NOTE: It is not necessary to remove the right firewall cover [58] if the right forward mount [4] is satisfactory.

- (k) If it is necessary to remove the vibration isolator [66] and/or the right forward mount [4], then do these steps:

NOTE: It is necessary to remove the vibration isolator [66] and right forward mount [4] if you find signs of wear and damage that are more than the limits for the right forward mount.

- 1) Remove the two nuts [65], four washers [68], two bushings [67] and two bolts [69] that attach the vibration isolator [66] to the right forward mount [4].
- 2) Remove the right forward mount [4] from the vibration isolator [66].
- 3) Remove the vibration isolator [66].

————— **END OF TASK** —————

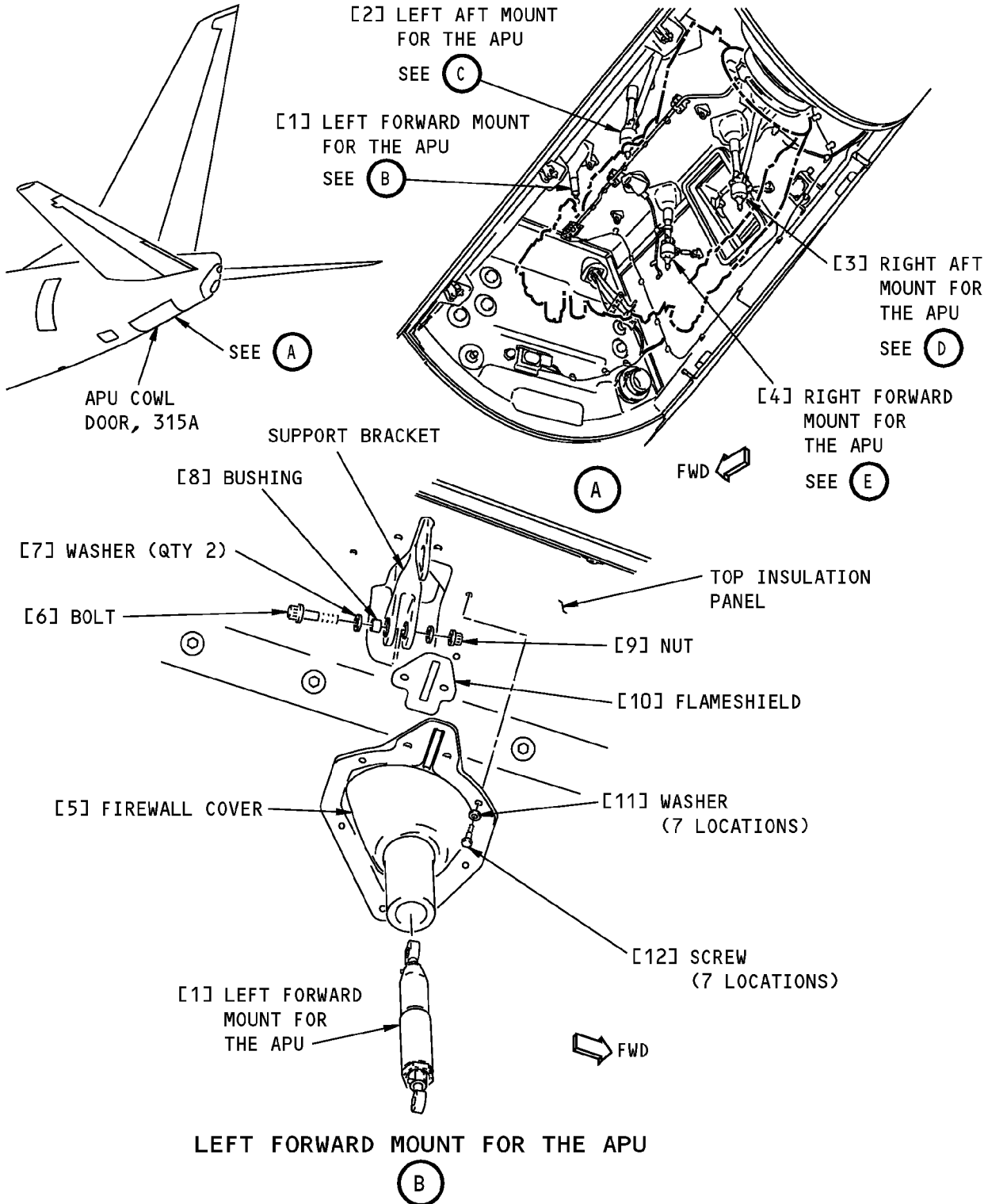
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**LEFT FORWARD MOUNT FOR THE APU**

(B)

**APU Mounts Installation**

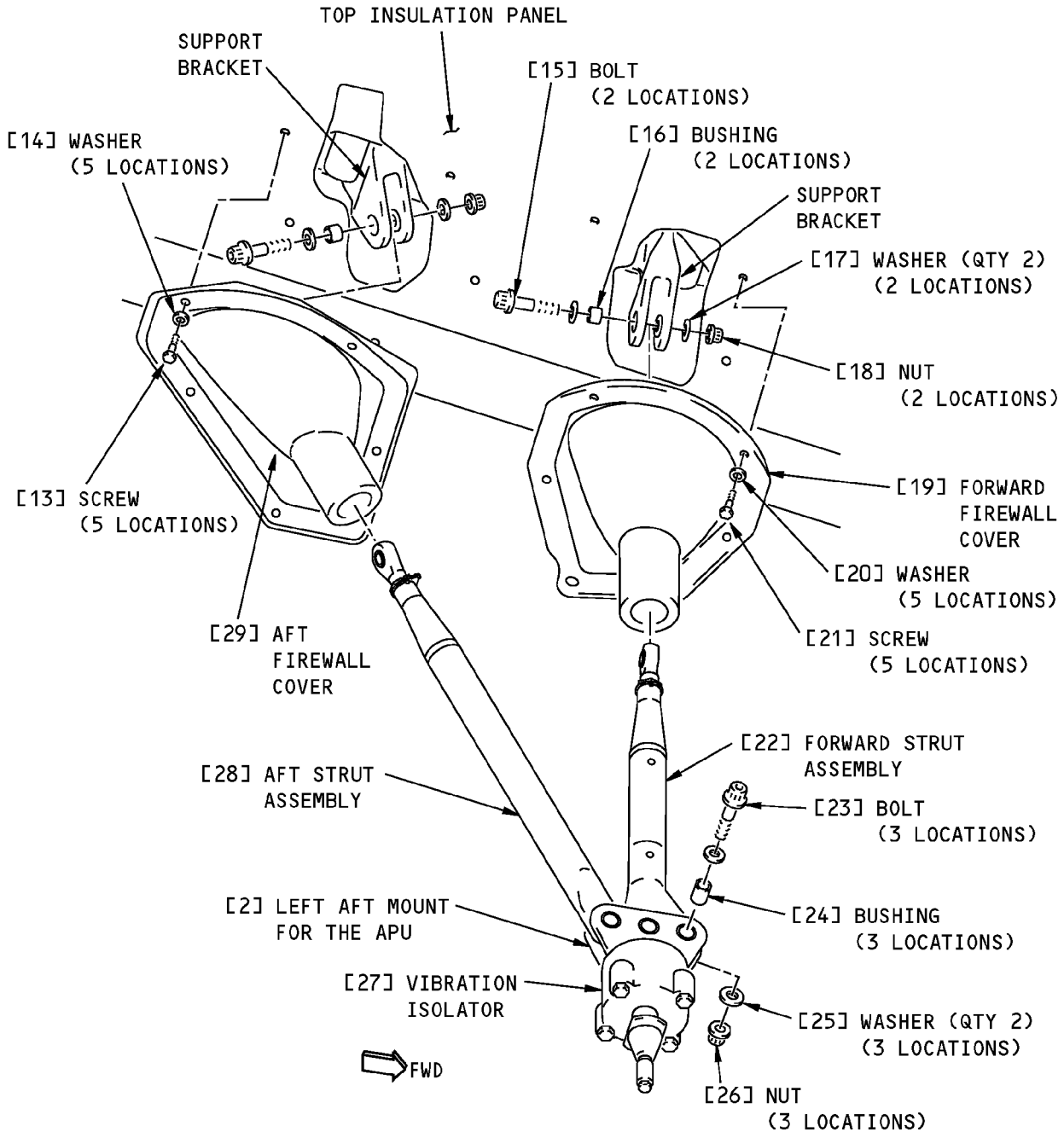
**Figure 401 (Sheet 1 of 5)/49-13-11-990-801**

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**LEFT AFT MOUNT FOR THE APU**

(C)

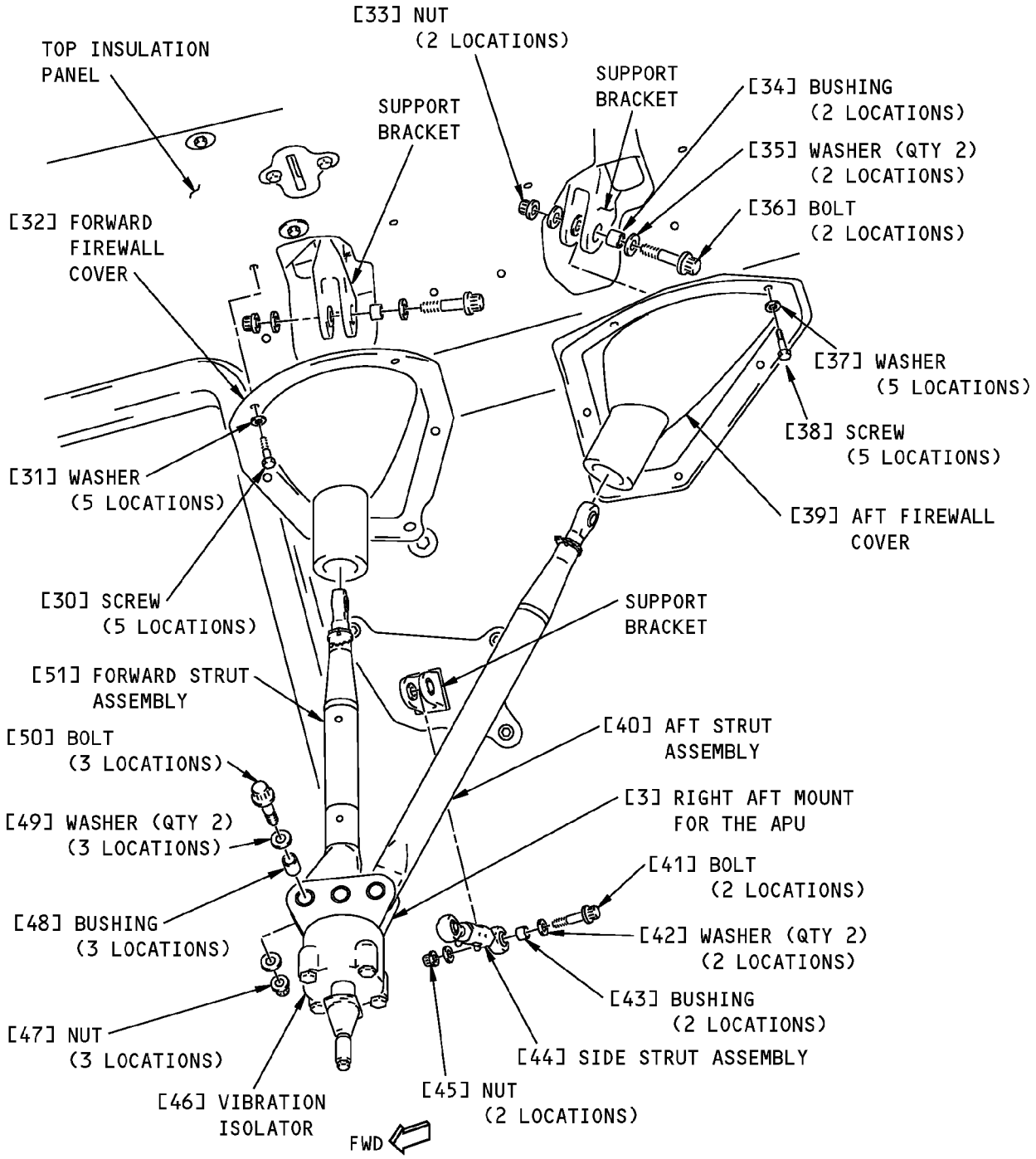
**APU Mounts Installation  
Figure 401 (Sheet 2 of 5)/49-13-11-990-801**

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**RIGHT AFT MOUNT FOR THE APU**

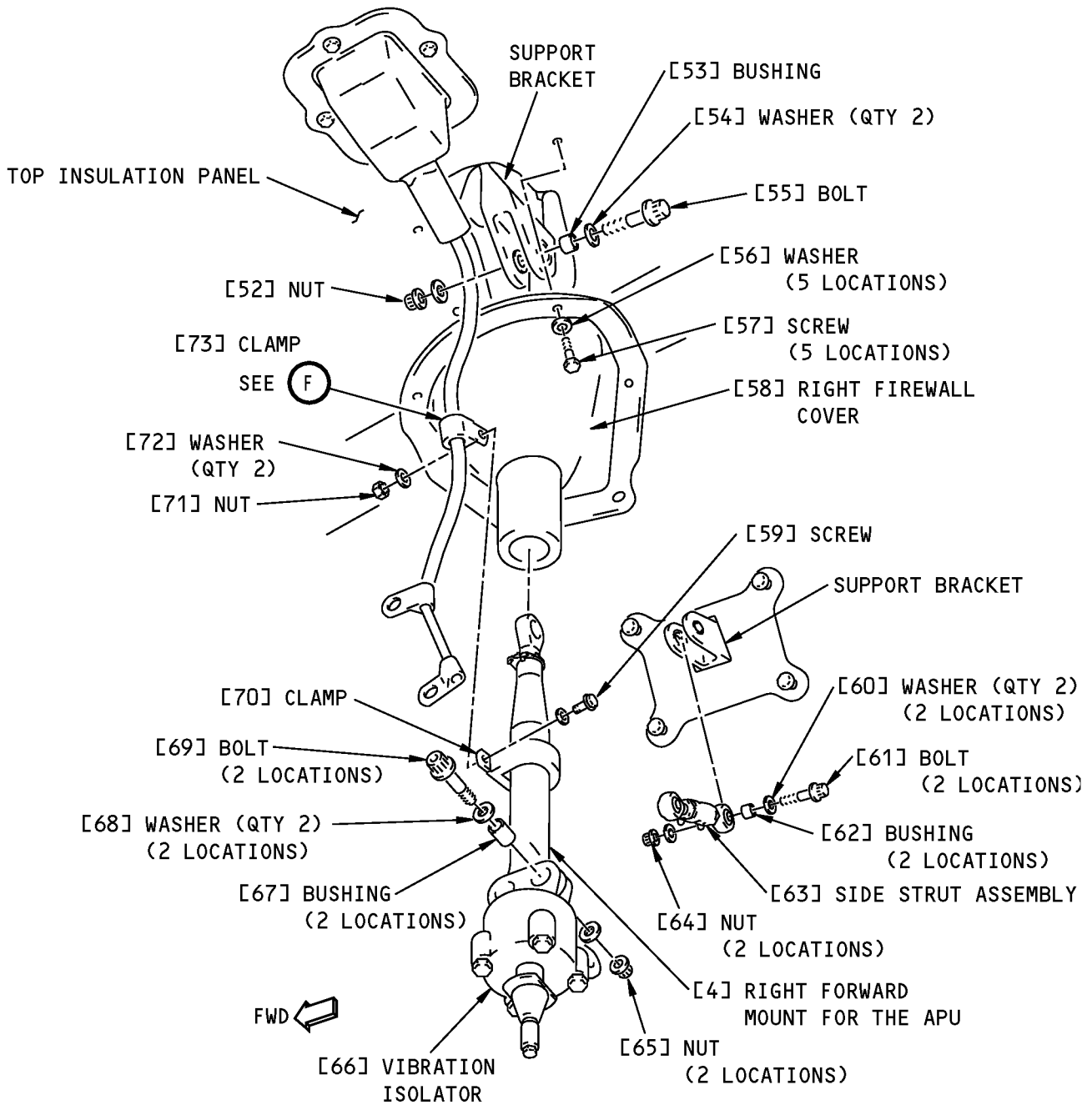
(D)

**APU Mounts Installation**  
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**RIGHT FORWARD MOUNT FOR THE APU**

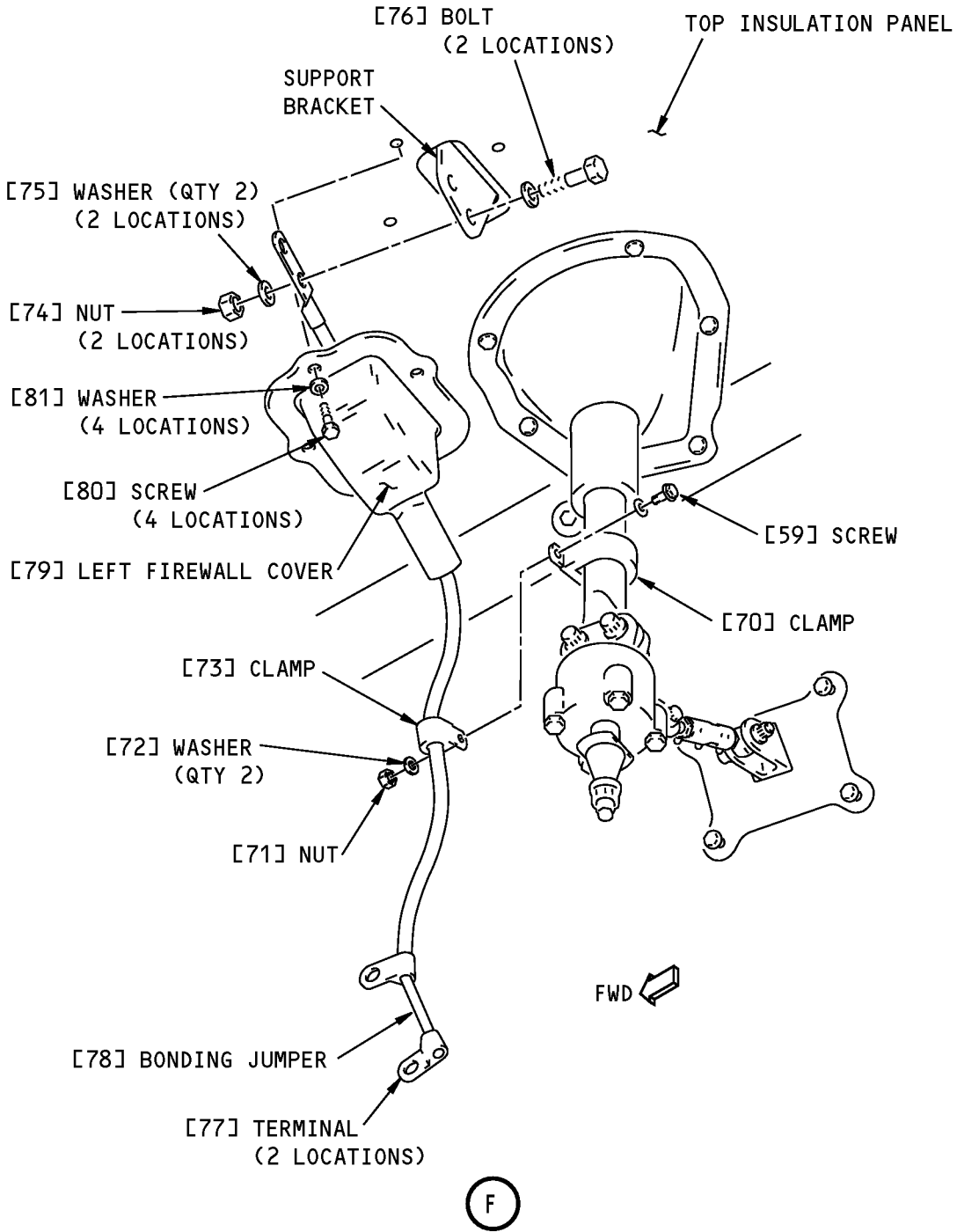
**(E)**

**APU Mounts Installation  
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TASK 49-13-11-400-802

3. APU Mounts Installation

(Figure 401)

A. References

Reference	Title
49-11-00-400-801	APU Power Plant Installation (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Meter - Bonding (Approved Explosion Proof & Intrinsically Safe) (Part #: C15292 (MODEL T477W), Supplier: 01014, A/P Effectivity: 737-ALL) (Part #: M1, Supplier: 3AD17, A/P Effectivity: 737-ALL) (Part #: M1B, Supplier: 3AD17, A/P Effectivity: 737-ALL)
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1064	Scraper - Phenolic, Hard Resin

C. Consumable Materials

Reference	Description	Specification
A00081	Adhesive - Silicone Rubber - RTV 106	BAC5010, Type 74
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Left forward mount	49-13-51-04-335	HAP 001-013, 015-026, 028-030
		49-13-51-04-440	HAP 001-013, 015-026, 028-030
		49-13-51-04A-410	HAP 031-054, 101-999
4	Right forward mount	49-13-51-04-135	HAP 001-013, 015-026, 028-030
		49-13-51-04A-130	HAP 031-054, 101-999
5	Firewall cover	49-13-51-04-335	HAP 001-013, 015-026, 028-030
		49-13-51-04A-315	HAP 031-054, 101-999
10	Flameshield	49-13-51-04-347	HAP 001-013, 015-026, 028-030
		49-13-51-04A-330	HAP 031-054, 101-999
19	Forward firewall cover	49-13-51-04-300	HAP 001-013, 015-026, 028-030
		49-13-51-04A-280	HAP 031-054, 101-999

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AMM Item	Description	AIPC Reference	AIPC Effectivity
22	Forward strut assembly	49-13-51-04-375	HAP 001-013, 015-026, 028-030
		49-13-51-04A-365	HAP 031-054, 101-999
27	Vibration isolator	49-13-51-04-170	HAP 001-013, 015-026, 028-030
		49-13-51-04A-165	HAP 031-054, 101-999
28	Aft strut assembly	49-13-51-04-370	HAP 001-013, 015-026, 028-030
		49-13-51-04A-360	HAP 031-054, 101-999
29	Aft firewall cover	49-13-51-04-200	HAP 001-013, 015-026, 028-030
		49-13-51-04-275	HAP 001-013, 015-026, 028-030
		49-13-51-04A-255	HAP 031-054, 101-999
32	Forward firewall cover	49-13-51-04-200	HAP 001-013, 015-026, 028-030
		49-13-51-04A-200	HAP 031-054, 101-999
39	Aft firewall cover	49-13-51-04-175	HAP 001-013, 015-026, 028-030
		49-13-51-04A-170	HAP 031-054, 101-999
40	Aft strut assembly	49-13-51-04-370	HAP 001-013, 015-026, 028-030
		49-13-51-04A-360	HAP 031-054, 101-999
44	Side strut assembly	49-13-51-04-025	HAP 001-013, 015-026, 028-030
		49-13-51-04A-030	HAP 031-054, 101-999
46	Vibration isolator	49-13-51-04-125	HAP 001-013, 015-026, 028-030
		49-13-51-04A-120	HAP 031-054, 101-999
51	Forward strut assembly	49-13-51-04-375	HAP 001-013, 015-026, 028-030
		49-13-51-04A-365	HAP 031-054, 101-999
58	Right firewall cover	49-13-51-04-200	HAP 001-013, 015-026, 028-030
		49-13-51-04A-200	HAP 031-054, 101-999
63	Side strut assembly	49-11-00-01-045	HAP 001-013, 015-026, 028-030
		49-11-00-02-055	HAP 031-054, 101-999
66	Vibration isolator	49-13-51-04-130	HAP 001-013, 015-026, 028-030
		49-13-51-04A-125	HAP 031-054, 101-999
79	Left firewall cover	49-13-51-04-250	HAP 001-013, 015-026, 028-030
		49-13-51-04A-230	HAP 031-054, 101-999

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

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### F. Procedure

SUBTASK 49-13-11-420-002

(1) Do these steps to install the left forward mount [1] for the APU:

(a) Visually examine the firewall cover [5] for the flameshield [10].

1) If the flameshield [10] is not installed, install the flameshield:

a) If you see remaining sealant on the firewall cover [5] and the top insulation panel, remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064 or an equivalent tool.

b) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.

c) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.

NOTE: It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

d) Apply the RTV 106 adhesive, A00081 or sealant, A00160 to the faying surface of the flameshield [10].

e) Install the flameshield [10] on the firewall cover [5].

f) Remove the unwanted adhesive or sealant from the firewall cover [5] with a cotton wiper, G00034.

NOTE: It is not necessary for the adhesive or sealant to dry. You can install the firewall cover [5] with the wet adhesive or sealant on the top insulation panel.

2) If the flameshield [10] is installed, clean the surface of the firewall cover [5] and the top insulation panel:

a) If you see remaining sealant on the firewall cover [5] and the top insulation panel, remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064 or an equivalent tool.

b) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.

c) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.

NOTE: It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

(b) If the firewall cover [5] was removed, put the firewall cover [5] on the left forward mount [1].

(c) Move the firewall cover [5] down until you can get access to the top end of the left forward mount [1].

(d) Install the top end of the left forward mount [1] to the support bracket with the bushing [8], two washers [7], bolt [6] and nut [9].

NOTE: You install the bushing adjacent to the bolt head.

(e) Install the firewall cover [5] to the top insulation panel with the seven washers [11] and seven screws [12].

(f) Apply a fillet seal of sealant, A00160 around the firewall cover [5].

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- (g) Remove the unwanted sealant from the firewall cover [5] and the top insulation panel with a cotton wiper, G00034.

NOTE: It is not necessary for the sealant to dry. You can install the other APU mounts or the APU with the wet sealant on the top insulation panel.

SUBTASK 49-13-11-420-003

- (2) Do these steps to install the left aft mount for the APU [2]:

NOTE: The left aft mount for the APU [2] has the forward strut assembly [22], aft strut assembly [28] and vibration isolator [27].

- (a) If the forward strut assembly [22], aft strut assembly [28] and/or vibration isolator [27] were removed from the left aft mount [2], then do these steps:
- 1) Put the forward strut assembly [22] and aft strut assembly [28] on the vibration isolator [27].
  - 2) Make sure the two directional FWD arrows on the vibration isolator [27] point to the front of the airplane.
  - 3) Install the vibration isolator [27] on the forward strut assembly [22] and aft strut assembly [28] with the three bushings [24], six washers [25], three bolts [23] and three nuts [26].

NOTE: You install the three bushings adjacent to the three bolt heads.

- (b) Clean the surface of the forward firewall cover [19] and aft firewall cover [29] and the top insulation panel:
- 1) If you see remaining sealant on the forward firewall cover [19] and aft firewall cover [29] and the top insulation panel, remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
  - 2) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.
  - 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.

NOTE: It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

- (c) If the forward firewall cover [19] and aft firewall cover [29] were removed, put the forward firewall cover [19] and aft firewall cover [29] on the forward strut assembly [22] and aft strut assembly [28].
- (d) Move the forward firewall cover [19] down until you can get access to the top end of the forward strut assembly [22].
- (e) Move the aft firewall cover [29] down until you can get access to the top end of the aft strut assembly [28].
- (f) Install the top ends of the forward strut assembly [22] and aft strut assembly [28] to the two support brackets with the two bushings [16], four washers [17], two bolts [15] and two nuts [18].

NOTE: You install the two bushings adjacent to the two bolt heads.

- (g) Install the forward firewall cover [19] to the top insulation panel with the five washers [20] and five screws [21].
- (h) Install the aft firewall cover [29] to the top insulation panel with the five washers [14] and five screws [13].

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- (i) Apply a fillet seal of sealant, A00160 around the forward firewall cover [19] and aft firewall cover [29].
- (j) Remove the unwanted sealant from the forward firewall cover [19] and aft firewall cover [29] and the top insulation panel with a cotton wiper, G00034.

**NOTE:** It is not necessary for the sealant to dry. You can install the other APU mounts or the APU with the wet sealant on the top insulation panel.

SUBTASK 49-13-11-420-004

- (3) Do these steps to install the right aft mount for the APU [3]:

**NOTE:** The right aft mount for the APU [3] has the aft strut assembly [40], side strut assembly [44], forward strut assembly [51] and vibration isolator [46].

- (a) If the aft strut assembly [40], forward strut assembly [51] and/or vibration isolator [46] were removed from the right aft mount [3], then do these steps:
  - 1) Put the aft strut assembly [40] and forward strut assembly [51] on the vibration isolator [46].
  - 2) Install the vibration isolator [46] on the aft strut assembly [40] and forward strut assembly [51] with the three bushings [48], six washers [49], three bolts [50] and three nuts [47].

**NOTE:** You install the three bushings adjacent to the three bolt heads.

- (b) Clean the surface of the forward firewall cover [32] and aft firewall cover [39] and the top insulation panel:
  - 1) If you see remaining sealant on the forward firewall cover [32] and aft firewall cover [39] and the top insulation panel, remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
  - 2) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.
  - 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

- (c) If the forward firewall cover [32] and aft firewall cover [39] were removed, put the forward firewall cover [32] and aft firewall cover [39] on the forward strut assembly [51] and aft strut assembly [40].
- (d) Move the forward firewall cover [32] down until you can get access to the top end of the forward strut assembly [51].
- (e) Move the aft firewall cover [39] down until you can get access to the top end of the aft strut assembly [40].
- (f) Install the top ends of the aft strut assembly [40] and forward strut assembly [51] to the two support brackets with the two bushings [34], four washers [35], two bolts [36] and two nuts [33].

**NOTE:** You install the two bushings adjacent to the bolt head.

- (g) Install the forward firewall cover [32] to the top insulation panel with the five washers [31] and five screws [30].
- (h) Install the aft firewall cover [39] to the top insulation panel with the five washers [37] and five screws [38].

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- (i) Apply a fillet seal of sealant, A00160 around the forward firewall cover [32] and aft firewall cover [39].
- (j) Remove the unwanted sealant from the forward firewall cover [32] and aft firewall cover [39] and the top insulation panel with a cotton wiper, G00034.

NOTE: It is not necessary for the sealant to dry. You can install the other APU mounts or the APU with the wet sealant on the top insulation panel.

- (k) Put the side strut assembly [44] into the support bracket and vibration isolator [46].
- (l) Install the two bushings [43], four washers [42], two bolts [41] and two nuts [45] that attach the side strut assembly [44] to the support bracket and vibration isolator [46].

NOTE: You install the two bushings adjacent to the two bolt heads.

SUBTASK 49-13-11-420-005

- (4) Do these steps to install the right forward mount [4] for the APU:

- (a) If the vibration isolator [66] was removed from the right forward mount [4], then do these steps:
  - 1) Put the right forward mount [4] on the vibration isolator [66].
  - 2) Install the vibration isolator [66] on the right forward mount [4] with the two bushings [67], four washers [68], two bolts [69] and two nuts [65].

NOTE: You install the two bushings adjacent to the two bolt heads.

- (b) Clean the surface of the right firewall cover [58] and the top insulation panel:
  - 1) If you see remaining sealant on the right firewall cover [58] and the top insulation panel, remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
  - 2) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.
  - 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.

NOTE: It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

- (c) If the right firewall cover [58] was removed, put the right firewall cover [58] on the right forward mount [4].
- (d) Move the right firewall cover [58] down until you can get access to the top end of the right forward mount [4].
- (e) Install the top end of the right forward mount [4] to the support bracket with the bushing [53], two washers [54], bolt [55] and nut [52].

NOTE: You install the bushing adjacent to the bolt head.

- (f) Install the right firewall cover [58] to the top insulation panel with the five washers [56] and five screws [57].
- (g) Apply a fillet seal of sealant, A00160 around the right firewall cover [58].
- (h) Remove the unwanted sealant from the right firewall cover [58] and the top insulation panel with a cotton wiper, G00034.

NOTE: It is not necessary for the sealant to dry. You can install the other APU mounts or the APU with the wet sealant on the top insulation panel.

- (i) If the left firewall cover [79] and bonding jumper [78] were removed, then do these steps:

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- 1) If you see remaining sealant on the left firewall cover [79], top insulation panel, two nuts [74], four washers [75], two bolts [76] and the lug for the bonding jumper [78], then do these steps to clean the surface of these parts:
  - a) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
  - b) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.
  - c) Continue to clean the surface until there are no visible residue on the surface.
  - d) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface of these parts.

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface of these parts.

- 2) If the left firewall cover [79] was removed, put the left firewall cover [79] on the bonding jumper [78].
- 3) Move the left firewall cover [79] down until you can get access to the top end of the bonding jumper [78].
- 4) Install the top end of the bonding jumper [78] to the support bracket with the four washers [75], two bolts [76] and two nuts [74].
- 5) Use an bonding meter, COM-1550 to make sure the bonding resistance between the bonding jumper [78] and the airplane structure is 0.0025 ohm or less.
- 6) Apply the sealant, A00247 over the two bolts [76], four washers [75], two nuts [74] and the lug of the bonding jumper [78] to prevent corrosion.

**NOTE:** It is not necessary for the sealant to dry.

- 7) Install the left firewall cover [79] to the top insulation panel with the four washers [81] and four screws [80].
- 8) Apply a fillet seal of sealant, A00160 around the left firewall cover [79].
- 9) Remove the unwanted sealant from the left firewall cover [79] and the top insulation panel with a cotton wiper, G00034.

**NOTE:** It is not necessary for the sealant to dry. You can install the other APU mounts or the APU with the wet sealant on the top insulation panel.

- 10) Make sure the two terminals [77] for the bonding jumper are installed correctly.
  - (j) Put the two clamps [70], [73] on the bonding jumper [78] and right forward mount [4].
  - (k) Install the two clamps [70], [73] with the two washers [72], screw [59] and nut [71].
  - (l) Put the side strut assembly [63] into the support bracket and vibration isolator [66].
  - (m) Install the two bushings [62], four washers [60], two bolts [61] and two nuts [64] that attach the side strut assembly [63] to the support bracket and vibration isolator [66].

**NOTE:** You install the two bushings adjacent to the two bolt heads.

SUBTASK 49-13-11-410-001

- (5) Install the APU. To install it, do this task: APU Power Plant Installation, TASK 49-11-00-400-801.

————— **END OF TASK** —————

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# AIRCRAFT MAINTENANCE MANUAL

## APU MOUNTS - INSPECTION/CHECK

### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
  - (1) An inspection of the APU mounts (APU installed)
  - (2) An inspection of the APU mounts (APU removed).
- C. There are two procedures available for the inspection of the APU mounts. You can do a general visual inspection of the APU mounts with the APU installed but there is only a small access to these parts. With the APU removed, you can get access to all parts of the APU mounts for the inspection.

### **TASK 49-13-11-200-802**

### 2. APU Mounts Inspection

#### A. APU Mounts Inspection

SUBTASK 49-13-11-200-001

- (1) Do one of these tasks to inspect the APU mounts:
  - (a) Do this task: APU Mounts Inspection (APU Installed), TASK 49-13-11-200-803.
  - (b) Do this task: APU Mounts Inspection (APU Removed), TASK 49-13-11-200-801.

————— **END OF TASK** —————

### **TASK 49-13-11-200-803**

### 3. APU Mounts Inspection (APU Installed)

#### A. General

- (1) This procedure is a scheduled maintenance task.

#### B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### C. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### D. Prepare for the Inspection

SUBTASK 49-13-11-860-002

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-13-11-860-003

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-13-11-010-004

(3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

**E. Procedure**

SUBTASK 49-13-11-210-002

(1) Do these steps to inspect the APU mounts:

- (a) Make sure all connections for the APU mounts are tight.
- (b) Visually examine these parts of the APU mounts that you can get access for corrosion, cracks and damage:
  - 1) Strut assemblies (APU mounts)
  - 2) Vibration isolators
  - 3) Cone bolts and nuts for the vibration isolator.
- (c) If you find corrosion, cracks or damage to these parts, then you must inspect the APU mounts with the APU removed. To inspect them, do this task: APU Mounts Inspection (APU Removed), TASK 49-13-11-200-801.

**F. Put the Airplane Back to Its Usual Condition**

SUBTASK 49-13-11-410-002

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

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SUBTASK 49-13-11-860-004

(2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-13-11-860-005

(3) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

————— **END OF TASK** —————

**TASK 49-13-11-200-801**

**4. APU Mounts Inspection (APU Removed)**

(Figure 601)

**A. General**

(1) This procedure is a scheduled maintenance task.

**B. References**

<u>Reference</u>	<u>Title</u>
49-11-00-000-801	APU Power Plant Removal (P/B 401)
49-11-00-400-801	APU Power Plant Installation (P/B 401)
49-13-11-000-802	APU Mounts Removal (P/B 401)
49-13-11-400-802	APU Mounts Installation (P/B 401)

**C. Location Zones**

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

**D. Procedure**

SUBTASK 49-13-11-210-001

(1) Do these steps to inspect the APU mounts:

- (a) Remove the APU. To remove it, do this task: APU Power Plant Removal, TASK 49-11-00-000-801.
- (b) Visually examine these parts for corrosion, cracks and damage:
  - 1) Strut assemblies (APU mounts)
  - 2) Vibration isolators
  - 3) Cone bolts and nuts for the vibration isolator.

**NOTE:** It is necessary to remove the firewall covers to get access to the APU mounts, support brackets and mounting parts.

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- (c) If you find corrosion, cracks or damage, then do these steps:
- 1) Remove the parts for the APU mounts that you find with corrosion, cracks or damage. To remove them, do this task: APU Mounts Removal, TASK 49-13-11-000-802.
  - 2) Visually examine the bolts and bushings for corrosion, wear and damage.
    - a) Replace the bolts and bushings that you find with corrosion or damage.
    - b) Replace all the parts that are more than the permitted wear limits shown in (Table 601).

Table 601/49-13-11-993-803 APU Mount Inspection

ITEM NUMBER	PART	DIMENSION	DESIGN LIMITS		WEAR LIMITS		REPAIR
			DIAMETER		PERMITTED WEAR	MAXIMUM CLEARANCE	
			MINIMUM	MAXIMUM			
			INCH (MM)	INCH (MM)	INCH (MM)	INCH (MM)	
1	ROD END	ID	0.3120 (7.92)	0.3125 (7.94)	0.3175 (8.06)	0.0100 (0.25)	*[1]
2	BOLT	OD	0.3115 (7.91)	0.3120 (7.92)	0.3060 (7.77)	0.0100 (0.25)	*[1]
3	ROD END	ID	0.2495 (6.34)	0.2500 (6.35)	0.2550 (6.48)	0.0100 (0.25)	*[1]
4	BOLT	OD	0.2490 (6.32)	0.2495 (6.34)	0.2435 (6.18)	0.0100 (0.25)	*[1]
5	ROD END	ID	0.3120 (7.92)	0.3125 (7.94)	0.3175 (8.06)	0.0100 (0.25)	*[1]
6	BOLT	OD	0.3115 (7.91)	0.3120 (7.92)	0.3060 (7.77)	0.0100 (0.25)	*[1]
7	STRUT	ID	0.5625 (14.29)	0.5631 (14.30)	----	----	*[2]
8	BUSHING	OD	0.4365 (11.09)	0.4370 (11.10)	0.4315 (10.96)	0.0100 (0.25)	*[1]
9	BUSHING	OD	0.5631 (14.30)	0.5638 (14.32)	----	----	*[3]
		ID	0.4400 (11.18)	0.4415 (11.21)	0.4465 (11.34)	0.0100 (0.25)	*[1]
10	BOLT	OD	0.2490 (6.32)	0.2495 (6.34)	0.2435 (6.18)	0.0100 (0.25)	*[1]
11	ROD END	ID	0.2497 (6.34)	0.2502 (6.36)	0.2552 (6.48)	0.0100 (0.25)	*[1]
12	STRUT	ID	0.5625 (14.29)	0.5631 (14.30)	----	----	*[2]

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(Continued)

ITEM NUMBER	PART	DIMENSION  INNER DIAMETER (ID) / OUTER DIAMETER (OD)	DESIGN LIMITS		WEAR LIMITS		REPAIR
			DIAMETER		PERMITTED WEAR	MAXIMUM CLEARANCE	
			MINIMUM	MAXIMUM			
INCH (MM)	INCH (MM)	INCH (MM)	INCH (MM)				
13	BUSHING	OD	0.4365 (11.09)	0.4370 (11.10)	0.4315 (10.96)	0.0100 (0.25)	*[1]
14	BUSHING	OD	0.5631 (14.30)	0.5638 (14.32)	----	----	*[3]
		ID	0.4400 (11.18)	0.4415 (11.21)	0.4465 (11.34)	0.0100 (0.25)	*[1]

\*[1] REPLACE WHEN WORN

\*[2] OVERSIZE STRUT HOLE MUST NOT BE MORE THAN 0.625 INCH (15.88 MM) IN DIAMETER

\*[3] REPLACE WITH OVERSIZE BUSHING

- 3) Examine the four bolts and four lockwashers that attach each housing assembly to each vibration isolator for tightness and missing part(s).
  - a) If it is necessary, tighten the bolts or replace the missing part(s).
- 4) Visually examine the surface of each vibration isolator for scratches, nicks, burrs, corrosion, galling, fretting and wear.
  - a) If the individual damaged area is more than 0.50 inch (12.70 mm) diameter by 0.20 inch (0.51 mm) depth or 1.00 inch (25.40 mm) length by 0.10 inch (2.54 mm) width by 0.020 inch (0.51 mm) depth, replace the vibration isolator.
  - b) If the total damaged area is more than 15% of the total surface area for the vibration isolator, replace the vibration isolator.
- 5) Visually examine the threads of the cone bolts and nuts on the vibration isolator for galling, wear and damage.
  - a) Replace the vibration isolator and nuts that you find with galling, wear or damage.
- 6) Install the new or serviceable part(s) for the APU mounts. To install it, do this task: APU Mounts Installation, TASK 49-13-11-400-802.
- (d) Make sure all connections for the APU mounts and support brackets are tight.
- (e) Install the APU. To install it, do this task: APU Power Plant Installation, TASK 49-11-00-400-801.

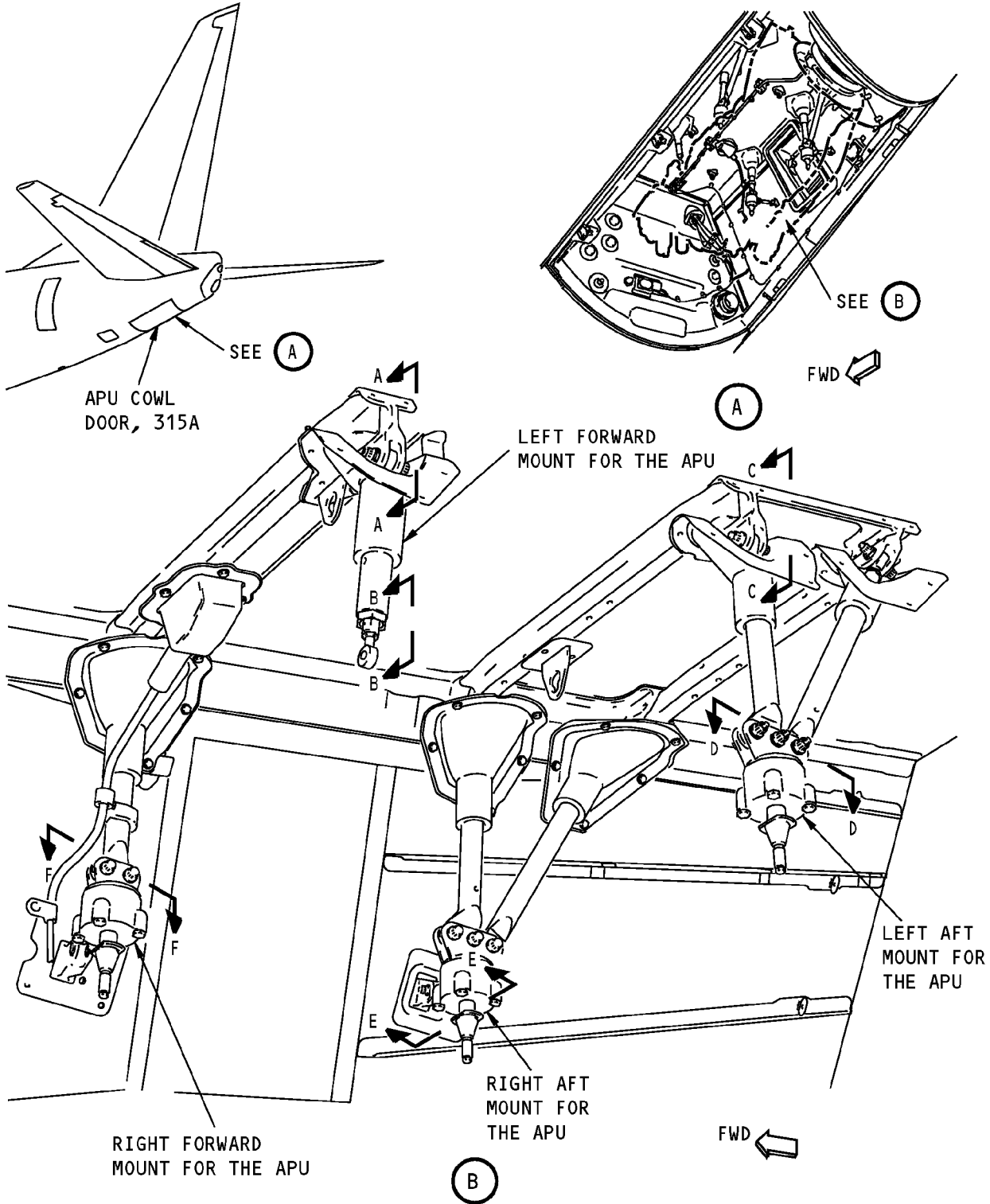
————— **END OF TASK** —————

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**APU Mounts Inspection  
Figure 601 (Sheet 1 of 2)/49-13-11-990-802**

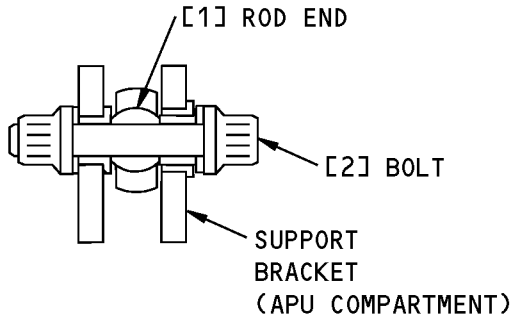
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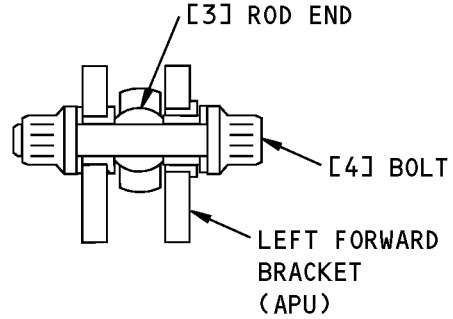
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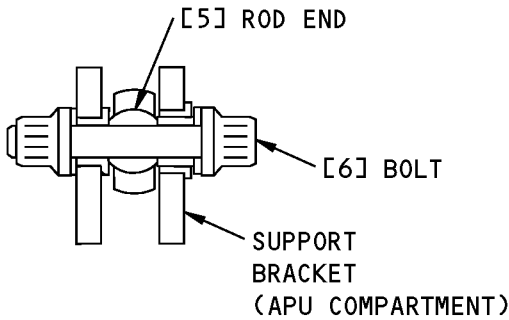


(2 LOCATIONS ON THE TWO FORWARD MOUNTS)

A-A

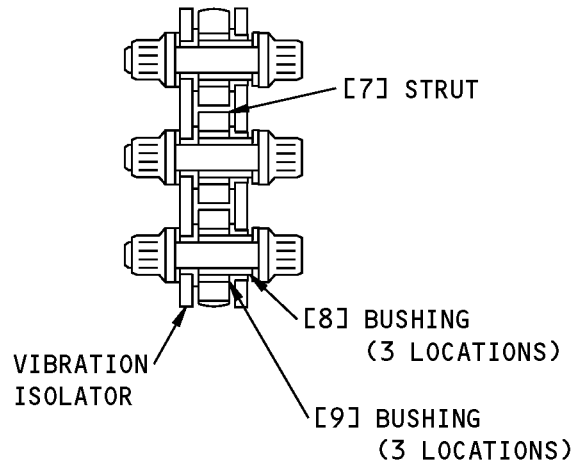


B-B



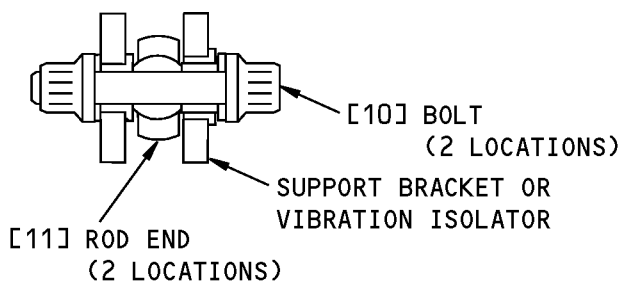
(4 LOCATIONS ON THE TWO AFT MOUNTS)

C-C

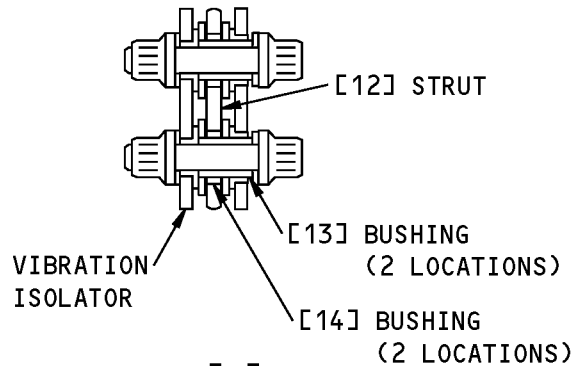


(2 LOCATIONS ON THE TWO AFT MOUNTS)

D-D



E-E



F-F

**APU Mounts Inspection**  
**Figure 601 (Sheet 2 of 2)/49-13-11-990-802**

EFFECTIVITY  
**HAP ALL**

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# AIRCRAFT MAINTENANCE MANUAL

## APU AIR INLET - ADJUSTMENT/TEST

### 1. General

- A. This procedure has these tasks:
  - (1) An adjustment of the air inlet door
  - (2) An adjustment of the position switch for the air inlet door
  - (3) An adjustment of the vortex generator flap
  - (4) A test of the air inlet door.
- B. The adjustments and the test for the air inlet door are necessary for the air inlet system to operate correctly. The three pushrods, position switch for the air inlet door and vortex generator flap must operate smoothly.
- C. The position switch for the air inlet door and vortex generator flap must be adjusted each time the position of the air inlet door changes. The position of the air inlet door changes when you remove it or align it again. You adjust the vortex generator flap after you complete the tasks to adjust the air inlet door and the position switch for the air inlet door.
- D. The position switch for the air inlet door is referred to as the door position switch.

### **TASK 49-15-00-800-801**

### 2. Air Inlet Door Adjustment

(Figure 501)

#### A. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

#### B. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

#### C. Prepare for the Adjustment

SUBTASK 49-15-00-860-001

- (1) Make sure the BAT switch on the P5 forward overhead panel is ON.

SUBTASK 49-15-00-860-002

- (2) Set the APU master switch on the P5 forward overhead panel to the ON position and attach a DO-NOT-OPERATE tag.

SUBTASK 49-15-00-860-031

- (3) Make sure the air inlet door opens in approximately 30 seconds.

SUBTASK 49-15-00-860-003

- (4) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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# AIRCRAFT MAINTENANCE MANUAL

SUBTASK 49-15-00-010-001

(5) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

### D. Procedure

SUBTASK 49-15-00-220-001

(1) Do the adjustment of the air inlet door in the fully open position:

(a) Measure the position of the air inlet door in the fully open position.

**NOTE:** The distance from above or below the inlet door housing to the top of the air inlet door must be less than 0.06 inch (1.5 mm).

(b) If the air inlet door is not in the limits, adjust the air inlet door:

1) Remove the two nuts [7], four washers [6], [5] and two bolts [4] that connect the two pushrod bearings to the two actuator arms [3].

2) Loosen one of the two locknuts [1] at each end of the two pushrods [2].

3) Turn the ends of the two pushrods [2] until the air inlet door aligns in the limits.

**NOTE:** The pushrod will move a distance of 0.02 inch (0.5 mm) with one half of a turn in one direction.

4) Tighten the two locknuts [1] on the two pushrods [2].

5) Put the two pushrods [2] into the two actuator arms [3].

6) Align the holes of the two pushrod bearings with the two actuator arms [3].

7) Install the two bolts [4], four washers [5], [6] and two nuts [7] that connect the two pushrod bearings to the two actuator arms [3].

SUBTASK 49-15-00-860-005

(2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-15-00-860-008

(3) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-15-00-860-009

(4) Set the APU master switch to the OFF position and attach a DO-NOT-OPERATE tag.

SUBTASK 49-15-00-860-032

(5) Make sure the air inlet door closes in approximately 30 seconds.

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AIRCRAFT MAINTENANCE MANUAL**

SUBTASK 49-15-00-860-010

(6) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-15-00-820-002

(7) Do the adjustment of the air inlet door in the closed position:

(a) Measure the position of the air inlet door in the closed position.

**NOTE:** The clearance between the center of the air inlet door and the inlet lip must be 1.30-1.40 inches (33.0-35.6 mm).

(b) If the air inlet door is not in the limits, adjust the air inlet door:

- 1) Remove the two nuts [7], four washers [6], [5] and two bolts [4] that connect the two pushrod bearings to the two actuator arms [3].
- 2) Loosen one of the two locknuts [1] at each end of the two pushrods [2].
- 3) Turn the ends of the two pushrods [2] until the air inlet door aligns in the limits.

**NOTE:** The pushrod will move a distance of 0.02 inch (0.5 mm) with one half of a turn in one direction.

- 4) Tighten the two locknuts [1] on the two pushrods [2].
- 5) Put the two pushrods [2] into the two actuator arms [3].
- 6) Align the holes of the two pushrod bearings with the two actuator arms [3].
- 7) Install the two bolts [4], four washers [5], [6] and two nuts [7] that connect the two pushrod bearings to the two actuator arms [3].

SUBTASK 49-15-00-860-012

(8) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-15-00-860-013

(9) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-15-00-820-003

(10) Do this task: Door Position Switch Adjustment, TASK 49-15-00-800-802.

————— **END OF TASK** —————

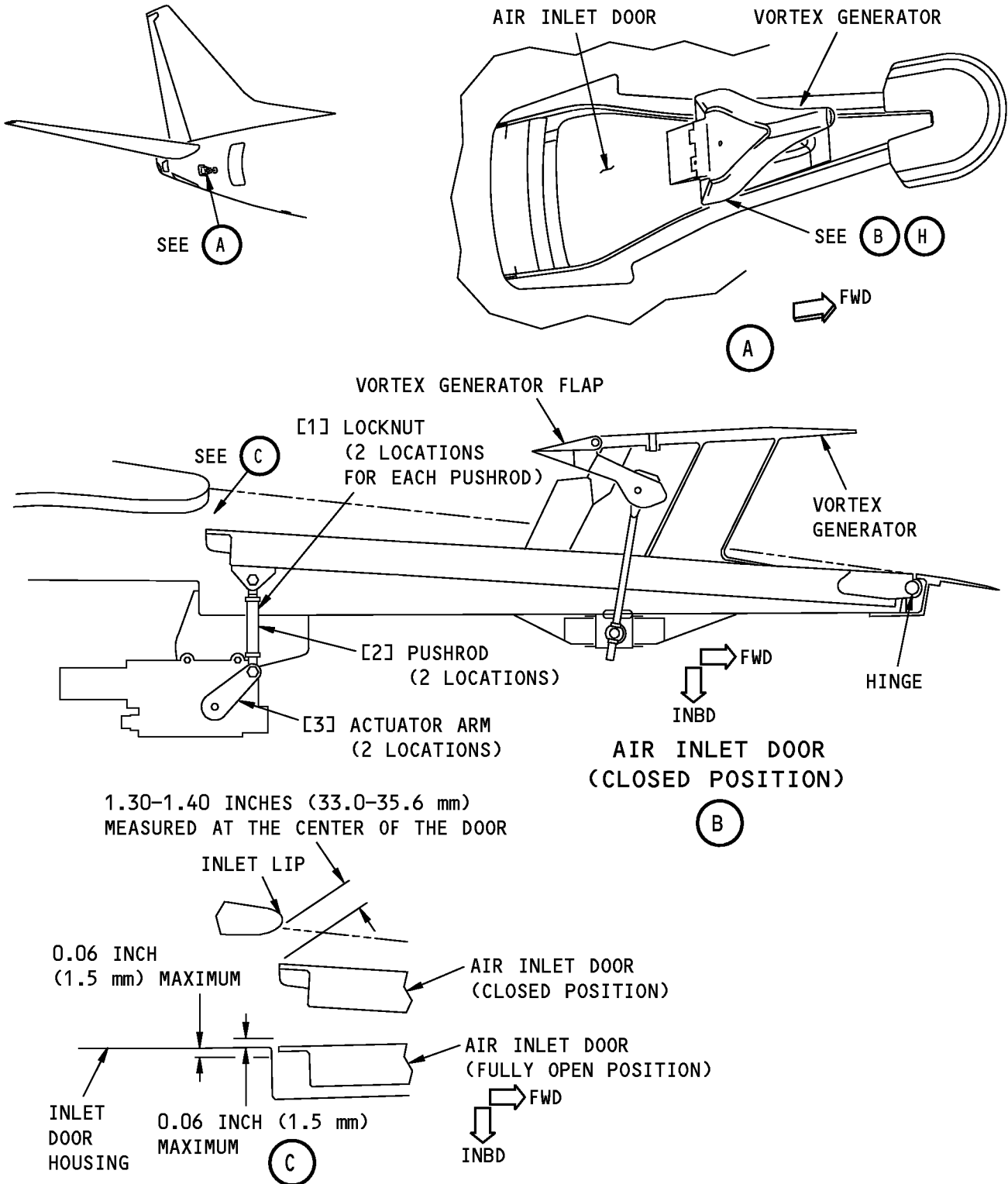
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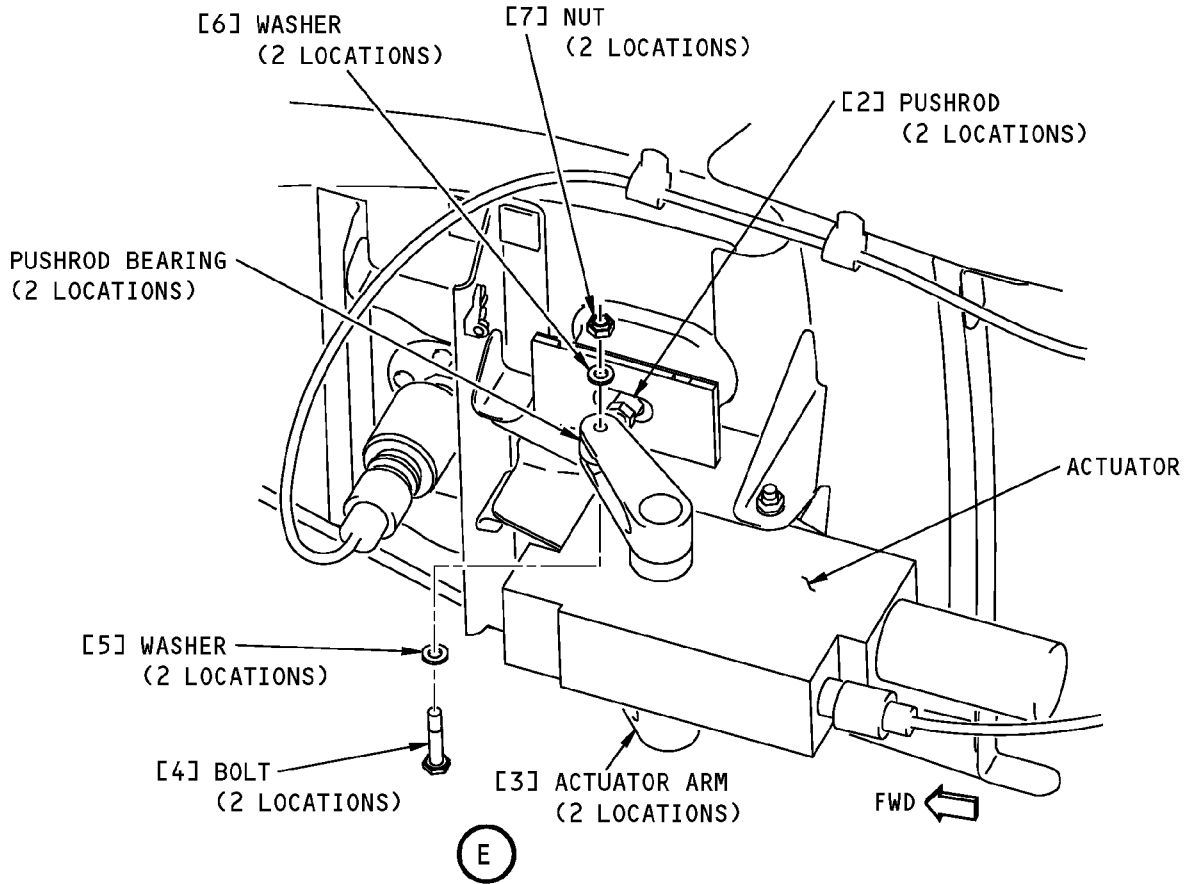
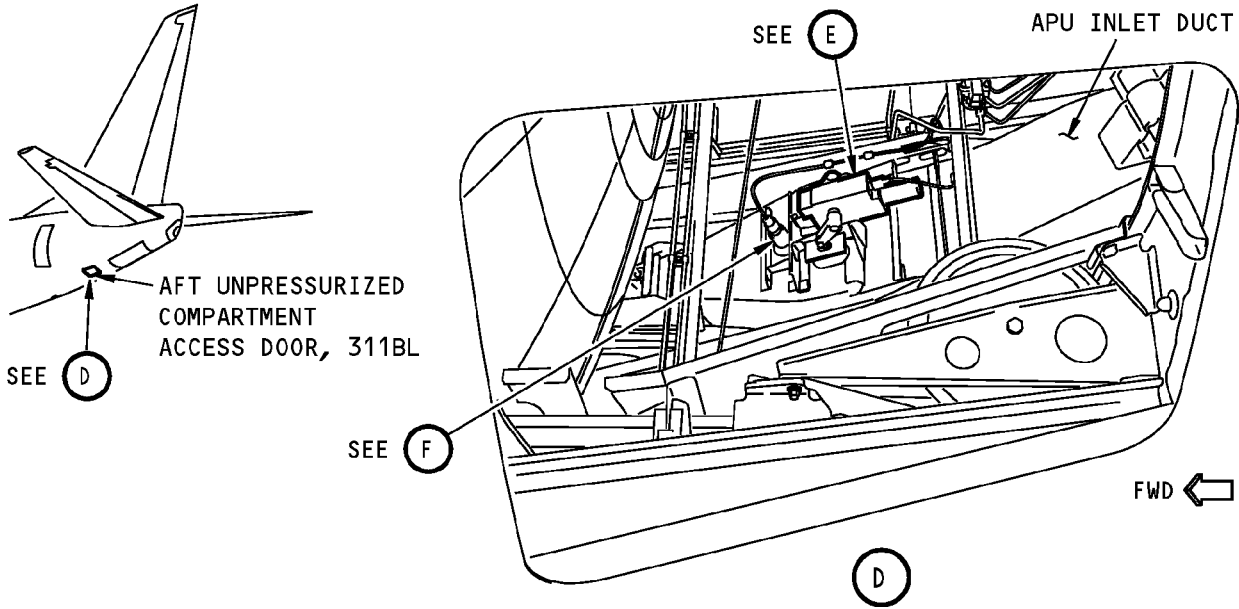


**Air Inlet Door Adjustment**  
**Figure 501 (Sheet 1 of 4)/49-15-00-990-801**

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**Air Inlet Door Adjustment  
Figure 501 (Sheet 2 of 4)/49-15-00-990-801**

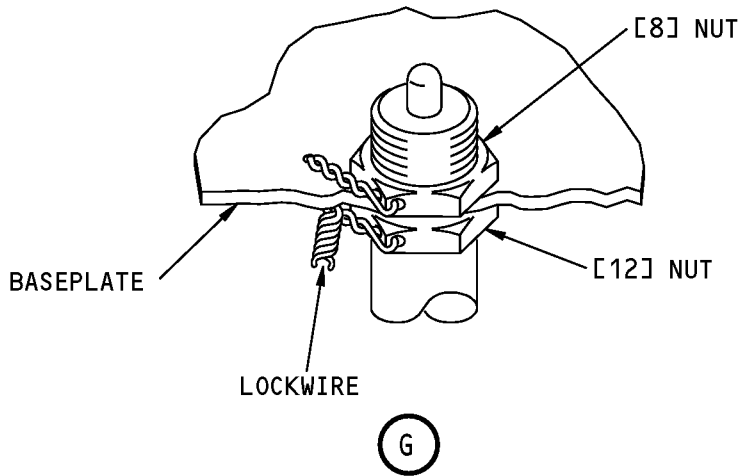
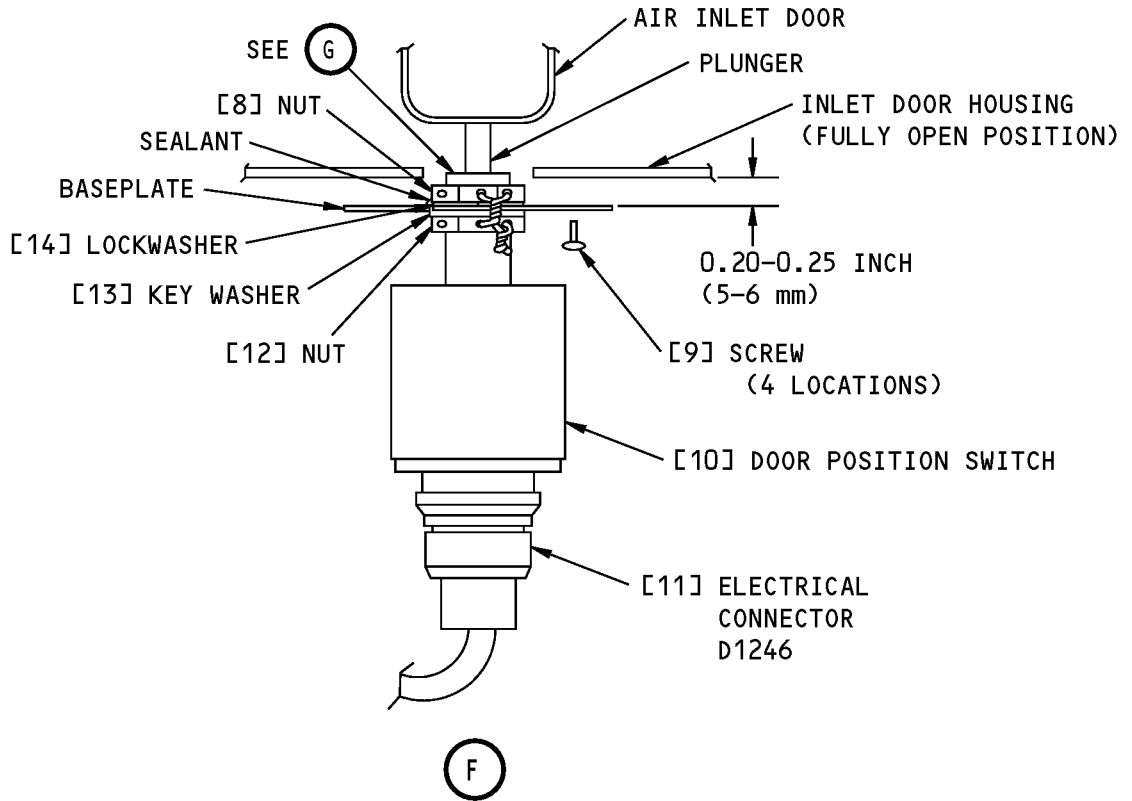
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**Air Inlet Door Adjustment**  
**Figure 501 (Sheet 3 of 4)/49-15-00-990-801**

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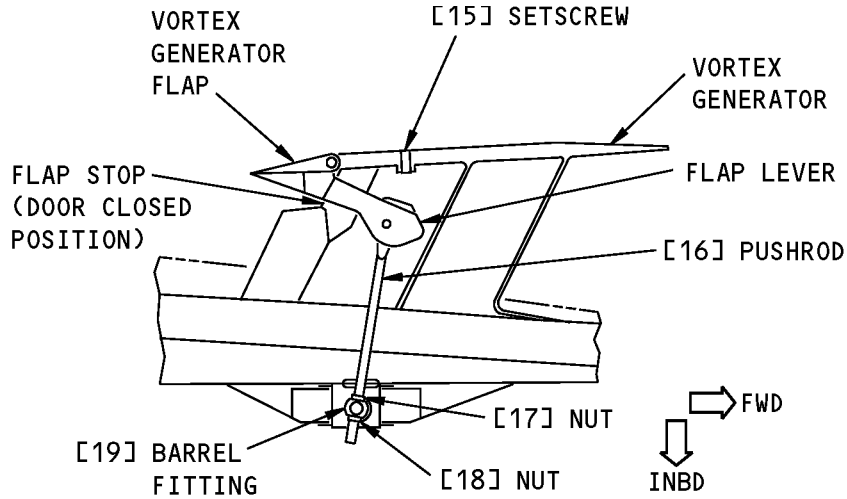
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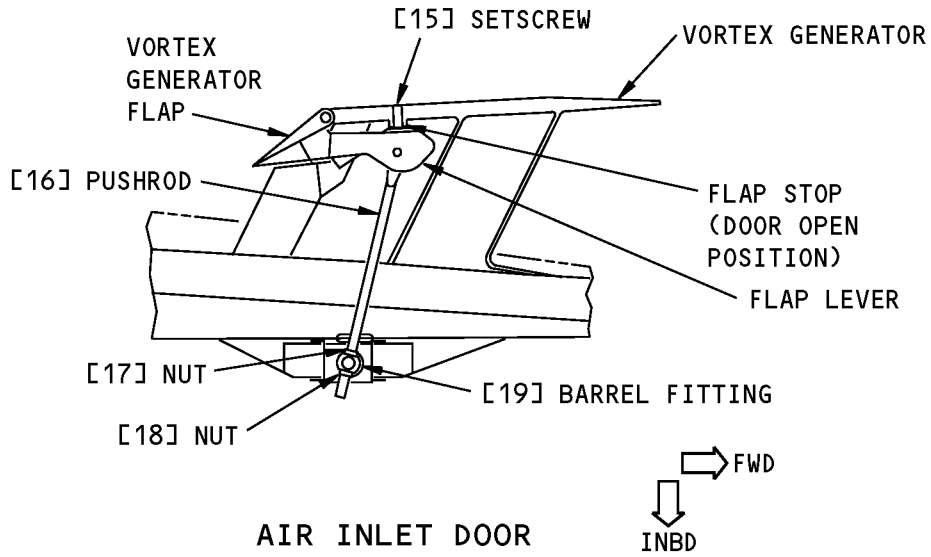


**AIRCRAFT MAINTENANCE MANUAL**



**AIR INLET DOOR  
(CLOSED POSITION)**

(H)



**AIR INLET DOOR  
(OPEN POSITION)**

(H)

**Air Inlet Door Adjustment  
Figure 501 (Sheet 4 of 4)/49-15-00-990-801**

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### AIRCRAFT MAINTENANCE MANUAL

#### TASK 49-15-00-800-802

#### 3. Door Position Switch Adjustment

(Figure 501)

##### A. Tools/Equipment

Reference	Description
STD-1064	Scraper - Phenolic, Hard Resin

##### B. Consumable Materials

Reference	Description	Specification
A00142	Sealant - Temperature Resistant, Fuel Pressure, And Weather Sealant	BMS5-44
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G01912	Lockwire - Monel (0.032 In. Dia.)	NASM20995N~ C32 (QQ-N-281)

##### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
10	Door position switch	49-15-41-01-010	HAP 001-013, 015-026, 028-030
		49-15-41-01A-010	HAP 031-054, 101-999

##### D. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

##### E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

##### F. Prepare for the Adjustment

SUBTASK 49-15-00-860-015

(1) Make sure the BAT switch on the P5 forward overhead panel is ON.

SUBTASK 49-15-00-860-016

(2) Set the APU master switch on the P5 forward overhead panel to the ON position and attach a DO-NOT-OPERATE tag.

SUBTASK 49-15-00-860-033

(3) Make sure the air inlet door opens in approximately 30 seconds.

SUBTASK 49-15-00-860-017

(4) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-15-00-010-002

(5) Make sure this access panel is open:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

**G. Procedure**

SUBTASK 49-15-00-020-001

(1) Disconnect the electrical connector D1246 [11] from the door position switch [10].

SUBTASK 49-15-00-020-002

(2) Do these steps to adjust the door position switch [10]:

- (a) Remove the four screws [9] that attach the baseplate to the inlet door housing.
- (b) Remove the door position switch [10] and baseplate from the inlet door housing.
- (c) Remove the lockwire from the two nuts [8], [12].
- (d) Put the door position switch [10] and baseplate on the inlet door housing.

**NOTE:** The plunger for the door position switch [10] must touch the air inlet door. Do not compress the plunger to the air inlet door.

- (e) Turn the two nuts [8], [12] to adjust the position of the door position switch [10] until you can get a clearance between the inlet door housing and the baseplate.

**NOTE:** The clearance between the bottom of the inlet door housing and the top of the baseplate must be 0.20-0.25 inch (5-6 mm).

- (f) Put the tab of the key washer [13] on the flat side of the nut [12].
- (g) Tighten the nut [8] to 30-40 pound-inches (3.4-4.5 newton-meters).
- (h) Remove the remaining sealant from the surface of the lockwasher [14] with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
- (i) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.
- (j) Use the cotton wiper, G00034 to dry the surface.
- (k) Apply a bead of sealant, A00142 around the lockwasher [14].
- (l) Install the lockwire, G01912 on the two nuts [8], [12].
- (m) Install the baseplate on the inlet door housing with the four screws [9].

SUBTASK 49-15-00-420-002

(3) Connect the electrical connector D1246 [11] to the door position switch [10].

SUBTASK 49-15-00-860-019

(4) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-15-00-860-022

- (5) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-15-00-860-023

- (6) Set the APU master switch to the OFF position.

SUBTASK 49-15-00-860-024

- (7) Make sure the air inlet door closes in approximately 30 seconds.

SUBTASK 49-15-00-820-004

- (8) Do this task: Vortex Generator Flap Adjustment, TASK 49-15-00-800-803.

**END OF TASK**

**TASK 49-15-00-800-803**

**4. Vortex Generator Flap Adjustment**

(Figure 501)

**A. Consumable Materials**

<u>Reference</u>	<u>Description</u>	<u>Specification</u>
G01912	Lockwire - Monel (0.032 In. Dia.)	NASM20995N~ C32 (QQ-N-281)

**B. Location Zones**

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

**C. Access Panels**

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

**D. Prepare for the Adjustment**

**NOTE:** The air inlet door and the door position switch must be adjusted before you adjust the vortex generator flap.

**NOTE:** The air inlet door must be in the closed position.

SUBTASK 49-15-00-860-025

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-15-00-010-003

- (2) Make sure this access panel is open:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

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E. Procedure

SUBTASK 49-15-00-820-005

(1) Do the adjustment of the vortex generator flap:

- (a) Loosen the setscrew [15] from the vortex generator approximately three to four turns.

NOTE: It is necessary to loosen the setscrew and the two nuts before you adjust the vortex generator flap.

- (b) Loosen the two nuts [17], [18] on the pushrod [16] until the nuts clear the barrel fitting [19].

NOTE: Make sure you loosen the nut [17] to the end of the pushrod threads. The position of this nut will permit the clearance necessary to examine the position of the air inlet door and vortex generator flap.

NOTE: You can get access to the nut [17] through a slot in the support channel.

- (c) Pull out on the trailing edge of the air inlet door.

NOTE: This step will make sure that the air inlet door and vortex generator flap are tight. The vortex generator flap must be tightly set against the flap stop for the door closed position.

- (d) Tighten the nut [18] by hand.

- (e) Tighten the nut [18] again with one and a half more turns.

- (f) Tighten the nut [17] against the barrel fitting [19].

- (g) Install the lockwire, G01912 on the two nuts [17], [18].

- (h) Make sure the BAT switch on the P5 forward overhead panel is ON.

- (i) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

- (j) Set the APU master switch to the ON position and attach a DO-NOT-OPERATE tag.

- (k) Make sure the air inlet door opens in approximately 30 seconds.

- (l) Turn the setscrew [15] until the setscrew touches the flap lever.

- (m) Tighten the setscrew [15] again with one and a half more turns.

- (n) Remove the DO-NOT-OPERATE tag from the APU master switch.

- (o) Set the APU master switch to the OFF position.

NOTE: The air inlet door closes in approximately 30 seconds.

SUBTASK 49-15-00-710-001

(2) Do a test of the vortex generator flap:

- (a) Set the APU master switch to the ON position and to the OFF position again and again.

NOTE: The air inlet door opens and closes in approximately 30 seconds. After 30 seconds, you can set the APU master switch to the other position.

- (b) Make sure the vortex generator flap operates smoothly.

SUBTASK 49-15-00-700-001

(3) Do this task: Air Inlet Door Test, TASK 49-15-00-700-801.

————— **END OF TASK** —————

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**TASK 49-15-00-700-801**

**5. Air Inlet Door Test**

(Figure 501)

A. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

B. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

C. Procedure

SUBTASK 49-15-00-710-002

(1) Do the test for the air inlet door:

(a) Make sure the air inlet door aligns correctly in the closed position.

1) Measure the position of the air inlet door in the closed position.

NOTE: The clearance between the center of the air inlet door and the inlet lip must be 1.30-1.40 inches (33.0-35.6 mm).

2) If the air inlet door is not in the limits, do this task: Air Inlet Door Adjustment, TASK 49-15-00-800-801.

(b) Make sure the BAT switch on the P5 forward overhead panel is ON.

(c) Set the APU master switch on the P5 forward overhead panel to the ON position and attach a DO-NOT-OPERATE tag.

(d) Make sure the air inlet door opens in approximately 30 seconds.

(e) Make sure the air inlet door aligns correctly in the fully open position.

1) Measure the position of the air inlet door in the fully open position.

NOTE: The distance from above or below the inlet door housing to the top of the air inlet door must be less than 0.06 inch (1.5 mm).

2) If the air inlet door is not in the limits, do this task: Air Inlet Door Adjustment, TASK 49-15-00-800-801.

(f) Remove the DO-NOT-OPERATE tag from the APU master switch.

(g) Set the APU master switch to the OFF position.

NOTE: The air inlet door closes in approximately 30 seconds.

(h) Set the APU master switch to the ON position and to the OFF position again and again.

NOTE: The air inlet door opens or closes in approximately 30 seconds. After 30 seconds, you can set the APU master switch to the other position.

(i) Make sure the air inlet door actuator operates correctly.

(j) If it is not necessary to do other tasks, set the BAT switch to the OFF position.

(k) Make sure the APU master switch is OFF.

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SUBTASK 49-15-00-410-001

(2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

————— **END OF TASK** —————

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**AIR INLET SEAL - REMOVAL/INSTALLATION**

**1. General**

- A. This procedure has these tasks:
  - (1) A removal of the air inlet seal
  - (2) An installation of the air inlet seal.
- B. The air inlet seal is installed on the inlet adapter assembly.

**TASK 49-15-11-000-801**

**2. Air Inlet Seal Removal**

(Figure 401)

A. References

Reference	Title
49-11-00-000-801	APU Power Plant Removal (P/B 401)

B. Location Zones

Zone	Area
316	APU Compartment - Right

C. Prepare for the Removal

SUBTASK 49-15-11-020-001

- (1) Remove the APU. To remove it, do this task: APU Power Plant Removal, TASK 49-11-00-000-801.

D. Air Inlet Seal Removal

SUBTASK 49-15-11-020-002

- (1) Do these steps to remove the air inlet seal [1]:

**CAUTION:** BE CAREFUL WHEN YOU INSTALL THE SCREWDRIVER THROUGH THE TOP ACCESS HOLES ON THE AIR INLET SEAL. DAMAGE TO THE AIR INLET SEAL CAN OCCUR.

- (a) Remove the 32 screws [2] that attach the air inlet seal [1] to the inlet adapter assembly [3].

**NOTE:** You can install a screwdriver through the top access holes on the air inlet seal [1] to help you remove the screws.

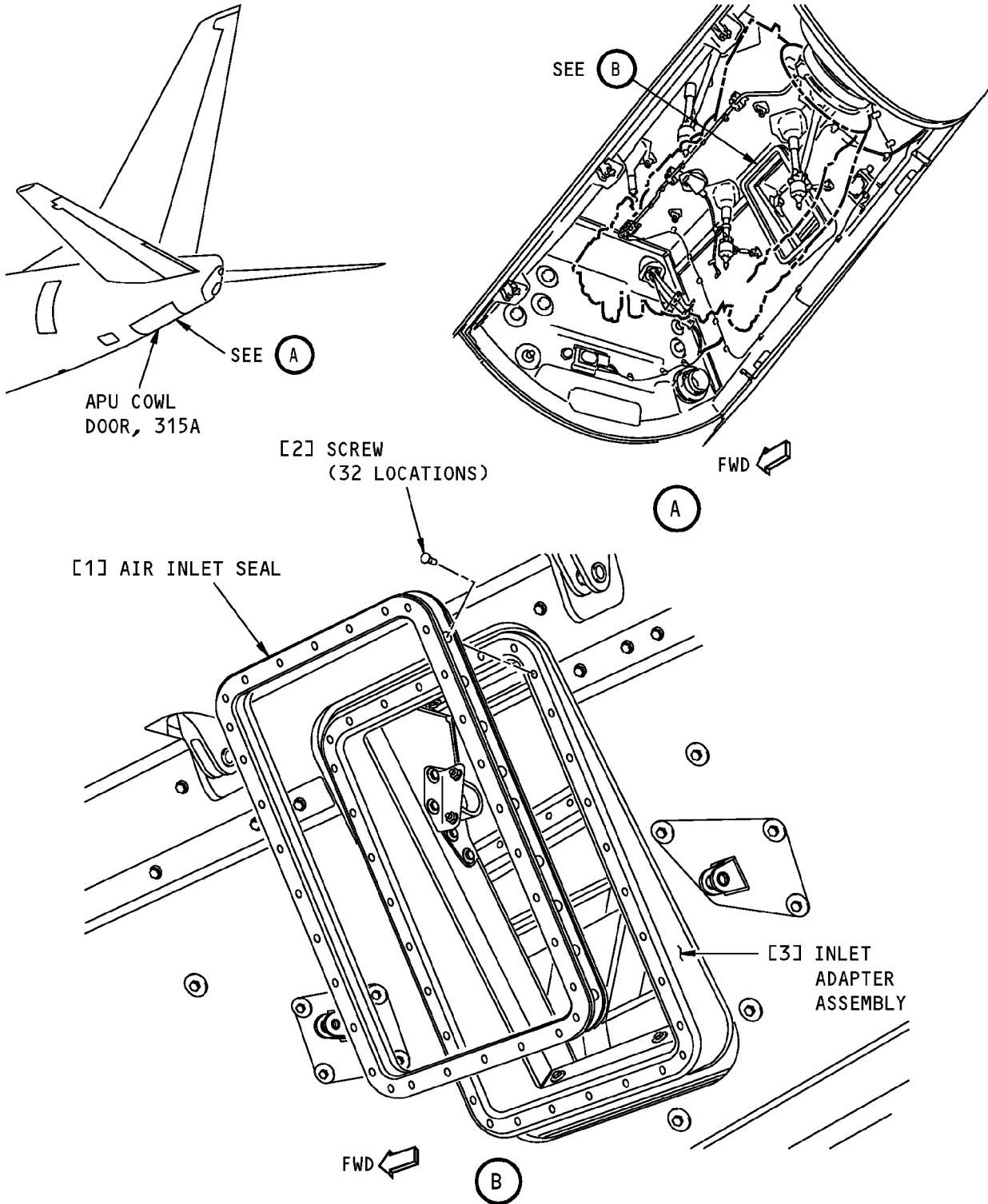
- (b) Remove the air inlet seal [1].
- (c) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

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**Air Inlet Seal Installation  
Figure 401/49-15-11-990-801**

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#### TASK 49-15-11-400-801

#### 3. Air Inlet Seal Installation

(Figure 401)

##### A. References

Reference	Title
49-11-00-400-801	APU Power Plant Installation (P/B 401)

##### B. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1064	Scraper - Phenolic, Hard Resin

##### C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

##### D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Air inlet seal	49-15-11-03-040	HAP 001-013, 015-026, 028-030
		49-15-11-04-025	HAP 031-054, 101-999

##### E. Location Zones

Zone	Area
316	APU Compartment - Right

##### F. Procedure

SUBTASK 49-15-11-110-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to clean the surfaces of the inlet adapter assembly [3]:
  - (a) Remove the remaining sealant from the surfaces of the inlet adapter assembly [3] with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
  - (b) Clean the surfaces of the inlet adapter assembly [3] with alcohol, B00130 and a cotton wiper, G00034.
  - (c) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surfaces of the inlet adapter assembly [3].

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surfaces of the inlet adapter assembly.

SUBTASK 49-15-11-420-001

- (2) Do these steps to install the air inlet seal [1]:
  - (a) Apply the sealant, A00160 to the faying surfaces of the air inlet seal [1].

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(b) Install the air inlet seal [1] on the inlet adapter assembly [3].

**CAUTION:** BE CAREFUL WHEN YOU INSTALL THE SCREWDRIVER THROUGH THE TOP ACCESS HOLES ON THE AIR INLET SEAL. DAMAGE TO THE AIR INLET SEAL CAN OCCUR.

(c) Install the 32 screws [2] that attach the air inlet seal [1] to the inlet adapter assembly [3].

**NOTE:** You can install a screwdriver through the top access holes on the air inlet seal [1] to help you install the screws.

(d) Remove the unwanted sealant from the inlet adapter assembly [3] with a cotton wiper, G00034.

**NOTE:** It is not necessary for the sealant to dry. You can install the APU with the wet sealant on the inlet adapter assembly.

(e) Make sure that the surfaces of the air inlet seal [1] shows no wrinkles, bubbles or inclusions.

SUBTASK 49-15-11-420-002

(3) Install the APU. To install it, do this task: APU Power Plant Installation, TASK 49-11-00-400-801.

————— **END OF TASK** —————

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## AIR INLET SEAL - INSPECTION/CHECK

### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has the task to inspect the air inlet seal.

#### **TASK 49-15-11-200-801**

### 2. Air Inlet Seal Inspection

(Figure 601)

#### A. General

- (1) This procedure is a scheduled maintenance task.

#### B. References

Reference	Title
49-11-00-000-801	APU Power Plant Removal (P/B 401)
49-11-00-400-801	APU Power Plant Installation (P/B 401)
49-15-11-000-801	Air Inlet Seal Removal (P/B 401)
49-15-11-400-801	Air Inlet Seal Installation (P/B 401)

#### C. Location Zones

Zone	Area
316	APU Compartment - Right

#### D. Prepare for the Removal

SUBTASK 49-15-11-010-001

- (1) Remove the APU. To remove it, do this task: APU Power Plant Removal, TASK 49-11-00-000-801.

#### E. Procedure

SUBTASK 49-15-11-210-001

- (1) Do these steps to inspect the air inlet seal [1]:

- (a) Examine the air inlet seal [1] for any signs of folding, tears or deformation.
- (b) Measure the height of the air inlet seal [1].

**NOTE:** The height from the bottom to the top of the air inlet seal [1] must be 1.375-1.625 inches (34.9-41.3 mm).

- (c) Make sure the retainer plate and stiffener plate are attached to the air inlet seal [1].

**NOTE:** You can find the retainer plate between the 32 screws and the air inlet seal [1]. You can find the stiffener plate on the bottom of the air inlet seal.

- (d) Examine the mating surfaces of the air inlet seal [1] for wrinkles, bubbles, unwanted materials or wear damage through the top rubber layer of fiberglass.

- (e) Examine the seven rubber layers of fiberglass for any separations, missing materials, cracks and tears.

- (f) If you find any of the above damage or the height of the air inlet seal [1] is not in the limits, replace the air inlet seal. These are the tasks:

- Air Inlet Seal Removal, TASK 49-15-11-000-801
- Air Inlet Seal Installation, TASK 49-15-11-400-801

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SUBTASK 49-15-11-410-001

(2) Install the APU. To install it, do this task: APU Power Plant Installation, TASK 49-11-00-400-801.

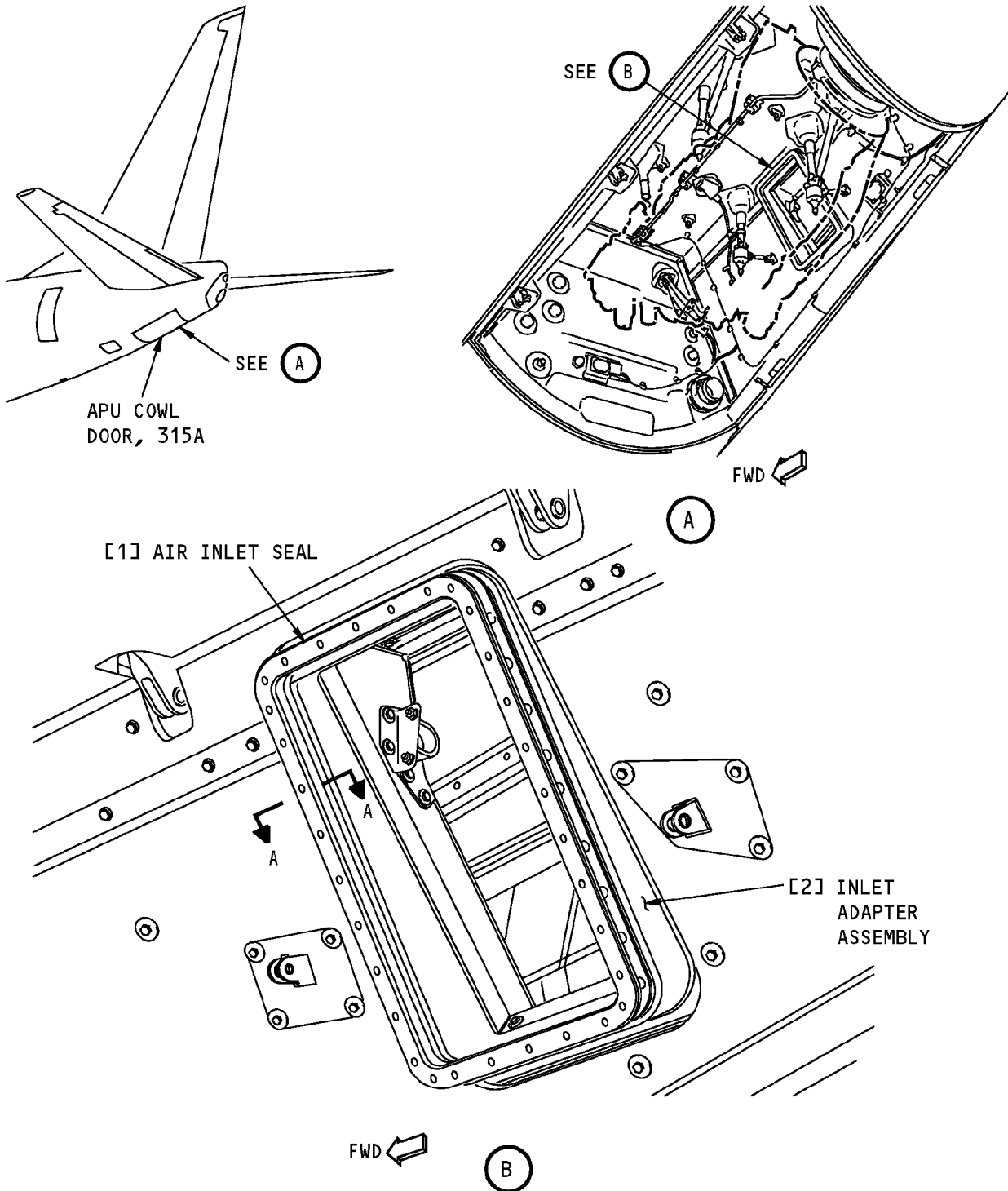
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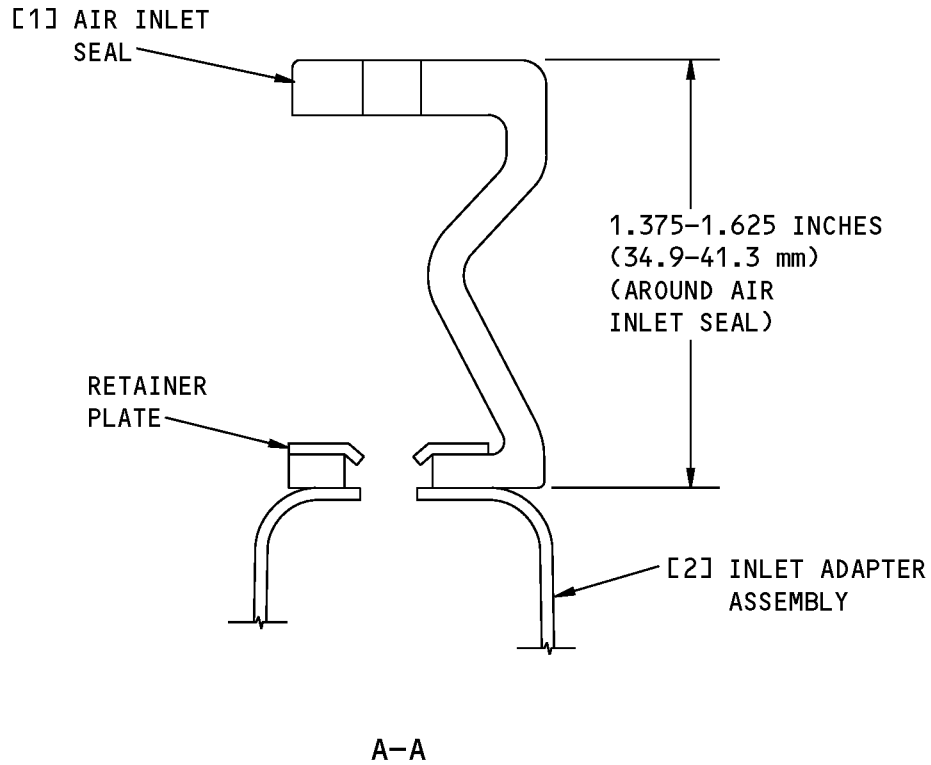
**Air Inlet Seal Inspection**  
**Figure 601 (Sheet 1 of 2)/49-15-11-990-802**

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**Air Inlet Seal Inspection  
Figure 601 (Sheet 2 of 2)/49-15-11-990-802**

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# AIRCRAFT MAINTENANCE MANUAL

## APU AIR INLET PLENUM - REMOVAL/INSTALLATION

### 1. General

- A. This procedure has these tasks:
  - (1) A removal of the air inlet plenum.
  - (2) An installation of the air inlet plenum.
- B. The air inlet plenum is installed between the air inlet door and the APU.

### I HAP 001-013, 015-026, 028-030

#### TASK 49-15-15-000-801

### 2. Air Inlet Plenum Removal (8 Piece Inlet Plenum)

(Figure 401)

#### A. References

Reference	Title
27-31-00-800-802	Remove Pressure from the Elevator Hydraulic Systems A and B (P/B 201)
49-11-00-000-801	APU Power Plant Removal (P/B 401)
49-17-11-000-801	Insulation Panel Removal (P/B 401)

#### B. Location Zones

Zone	Area
311	Area Aft of Pressure Bulkhead - Left
314	Stabilizer Torsion Box Compartment - Right
316	APU Compartment - Right

#### C. Prepare for the removal

SUBTASK 49-15-15-040-001

- (1) Position the control column in the neutral position and place a DO-NOT-MOVE tag on the control column.

SUBTASK 49-15-15-040-002

- (2) Set the FLT CONTROL A and B switches to OFF.

SUBTASK 49-15-15-040-003

- (3) Do this task: Remove Pressure from the Elevator Hydraulic Systems A and B, TASK 27-31-00-800-802.

SUBTASK 49-15-15-000-001

- (4) Remove the APU. To remove it, do this task: APU Power Plant Removal, TASK 49-11-00-000-801

SUBTASK 49-15-15-000-003

- (5) Remove the forward right, aft right, and upper APU compartment firewall insulation panels. To remove them, do this task: Insulation Panel Removal, TASK 49-17-11-000-801

#### D. Air Inlet Plenum Removal

SUBTASK 49-15-15-000-004

- (1) Do these steps to remove the Diffuser Duct [1]:
  - (a) Remove the 26 Nuts [5], 26 Bolts [7], and 26 Washers [6] that attach the Diffuser Duct [1] to the Transition Duct [2].

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HAP 001-013, 015-026, 028-030 (Continued)

- (b) Remove the Diffuser Duct [1].
- (c) Remove and discard the Gasket [3].

SUBTASK 49-15-15-000-005

- (2) Do these steps to remove the Transition Duct [2]:
  - (a) Remove the 24 Bolts [8] and 24 Washers [9] that attach the Transition Duct [2] to the Station 1088 Bulkhead.
  - (b) Remove the Transition Duct [2].
  - (c) Remove and discard the Gasket [4].

SUBTASK 49-15-15-000-006

- (3) Do these steps to remove the Inlet Adapter Assembly [10]:
  - (a) Remove the seven Bolts [11] and seven Washers [12] that attach the forward side of the Inlet Adapter Assembly [10] to the Air Inlet Plenum.
  - (b) Remove the seven Bolts [15] and seven Washers [16] that attach the aft side of the Inlet Adapter Assembly [10] to the Air Inlet Plenum.
  - (c) Remove the Inlet Adapter Assembly [10].

SUBTASK 49-15-15-000-007

- (4) Do these steps to disconnect the Cable Guard Tube from the Air Inlet Plenum:
  - (a) Remove the four Screws [44], eight Washers [45], and four Nuts [46] from the two Clamps [43].
  - (b) Remove the Clamps [43] from the Cable Guard Tube.
  - (c) Remove the five Bolts [17] and five Washers [18] from the Bracket [19], Doubler [20], Upper Plate [21], and Lower Plate [22].
  - (d) Remove the Bracket [19], Doubler [20], Upper Plate [21], and Lower Plate [22] from the Air Inlet Plenum.
  - (e) Remove the four Bolts [23] and four Washers [24] from the Bracket [25], Cover Plate [26], Cover Plate Assembly [27], and aft Cover Plate Assembly [28].
  - (f) Remove the Bracket [25], Cover Plate [26], Cover Plate Assembly [27], and aft Cover Plate Assembly [28] from the Air Inlet Plenum.

SUBTASK 49-15-15-000-008

- (5) Do these steps to remove the Air Inlet Plenum:
  - (a) Remove the 18 Screws [30] and 18 Washers [31] that attach the Top Forward Panel Assembly [36].
  - (b) Remove the Top Forward Panel Assembly [36].
  - (c) Remove the five Bolts [32], 14 Screws [30], and 14 Washers [31] that attach the Upper End Panel [35].
  - (d) Remove the 27 Screws [30] and 27 Washers [31] that attach the Top Aft Panel Assembly [37].
  - (e) Remove the Top Aft Panel Assembly [37].
  - (f) Remove the 31 Screws [30] and 31 Washers [31] that attach the Outboard Panel Assembly [38].

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- (g) Remove the 29 Screws [30] and 29 Washers [31] that attach the Inboard Panel Assembly [39].
- (h) Remove the Inboard Panel Assembly [39].
- (i) Remove the eight Bolts [33], eight Washers [34], two Screws [30], and two Washers [31] that attach the Frame Assembly [40].
- (j) Remove the Frame Assembly [40].
- (k) Remove the Upper End Panel [35].
- (l) Remove the five Bolts [32], 10 Screws [30], and 10 Washers [31] that attach the Floor Panel Assembly [41].
- (m) Remove the Floor Panel Assembly [41].
- (n) Remove the Outboard Panel Assembly [38].
- (o) Remove the eight Bolts [32] that attach the Aft Bulkhead Assembly [42].
- (p) Remove the Aft Bulkhead Assembly [42].

————— **END OF TASK** —————

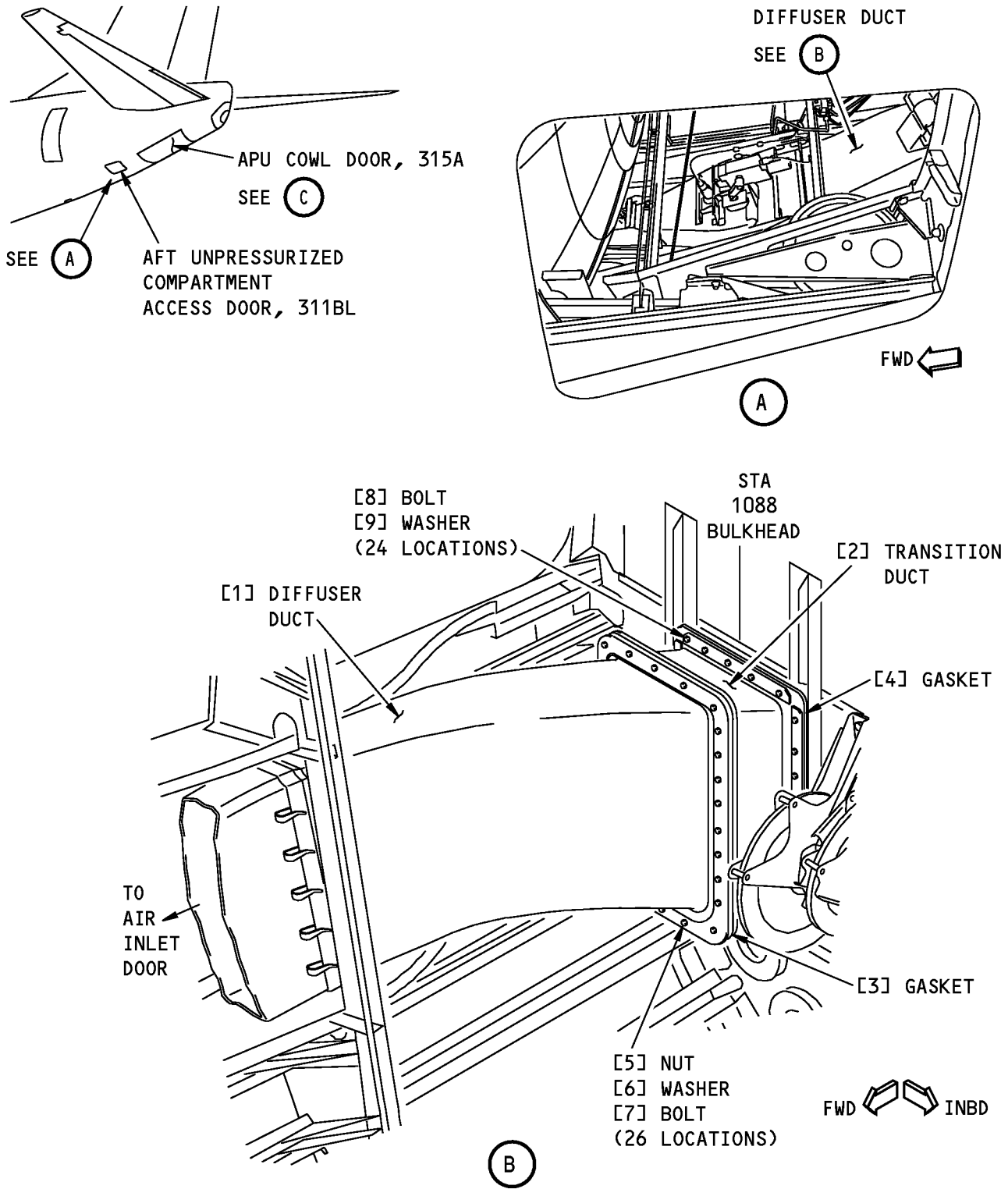
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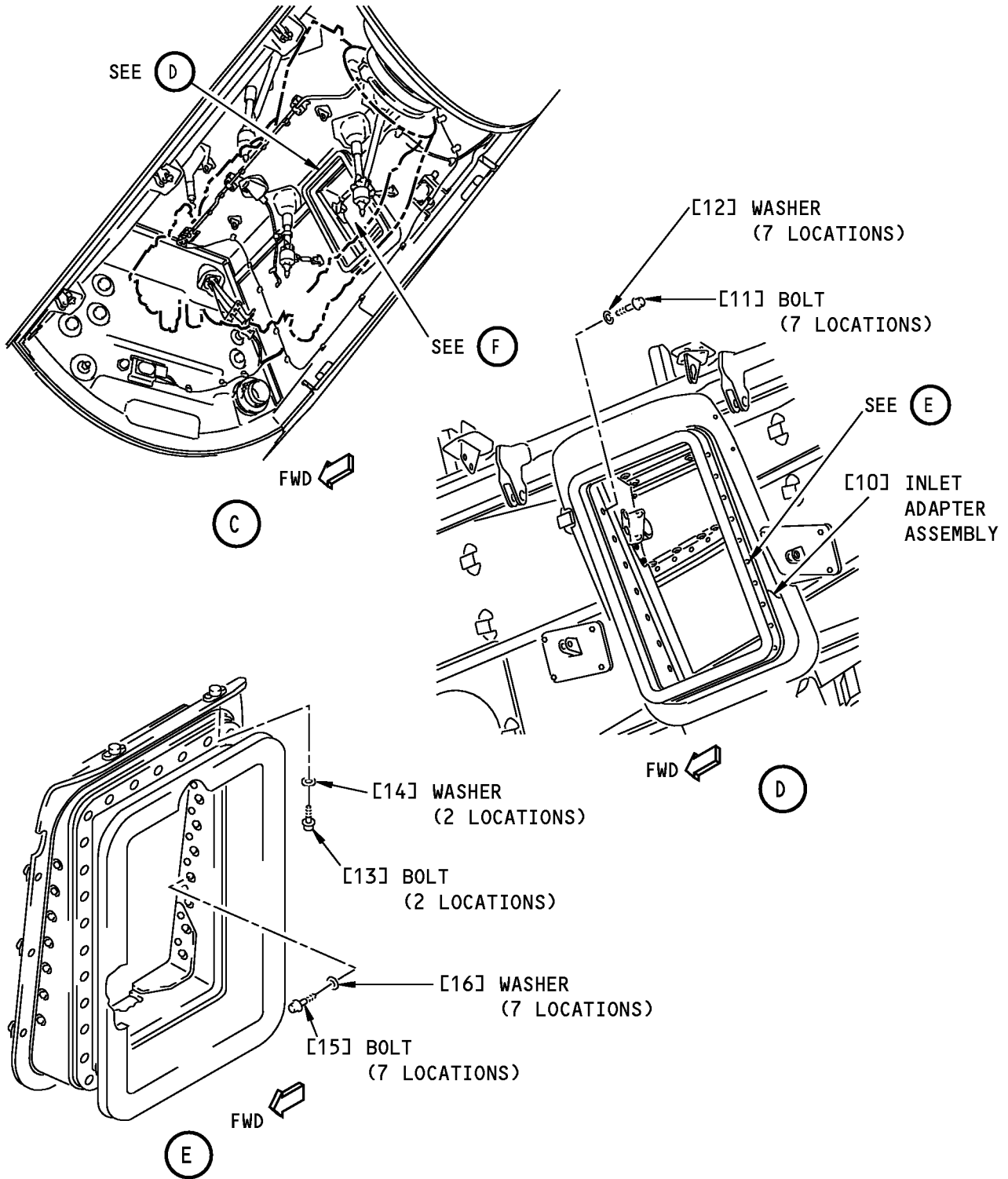
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**Air Inlet Plenum Removal (8 Piece Inlet Plenum)**  
**Figure 401 (Sheet 1 of 4)/49-15-15-990-801**

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**Air Inlet Plenum Removal (8 Piece Inlet Plenum)**  
**Figure 401 (Sheet 2 of 4)/49-15-15-990-801**

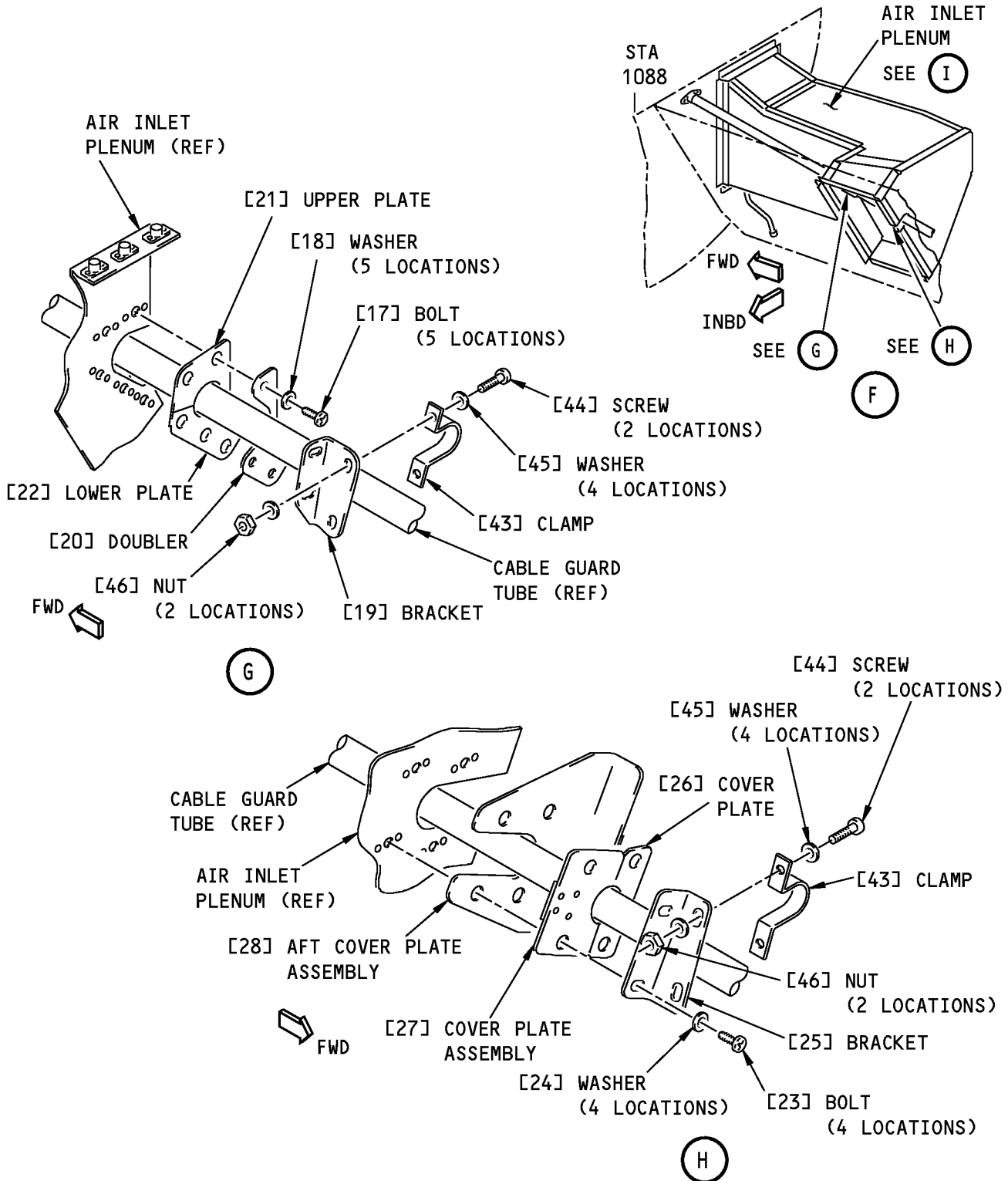
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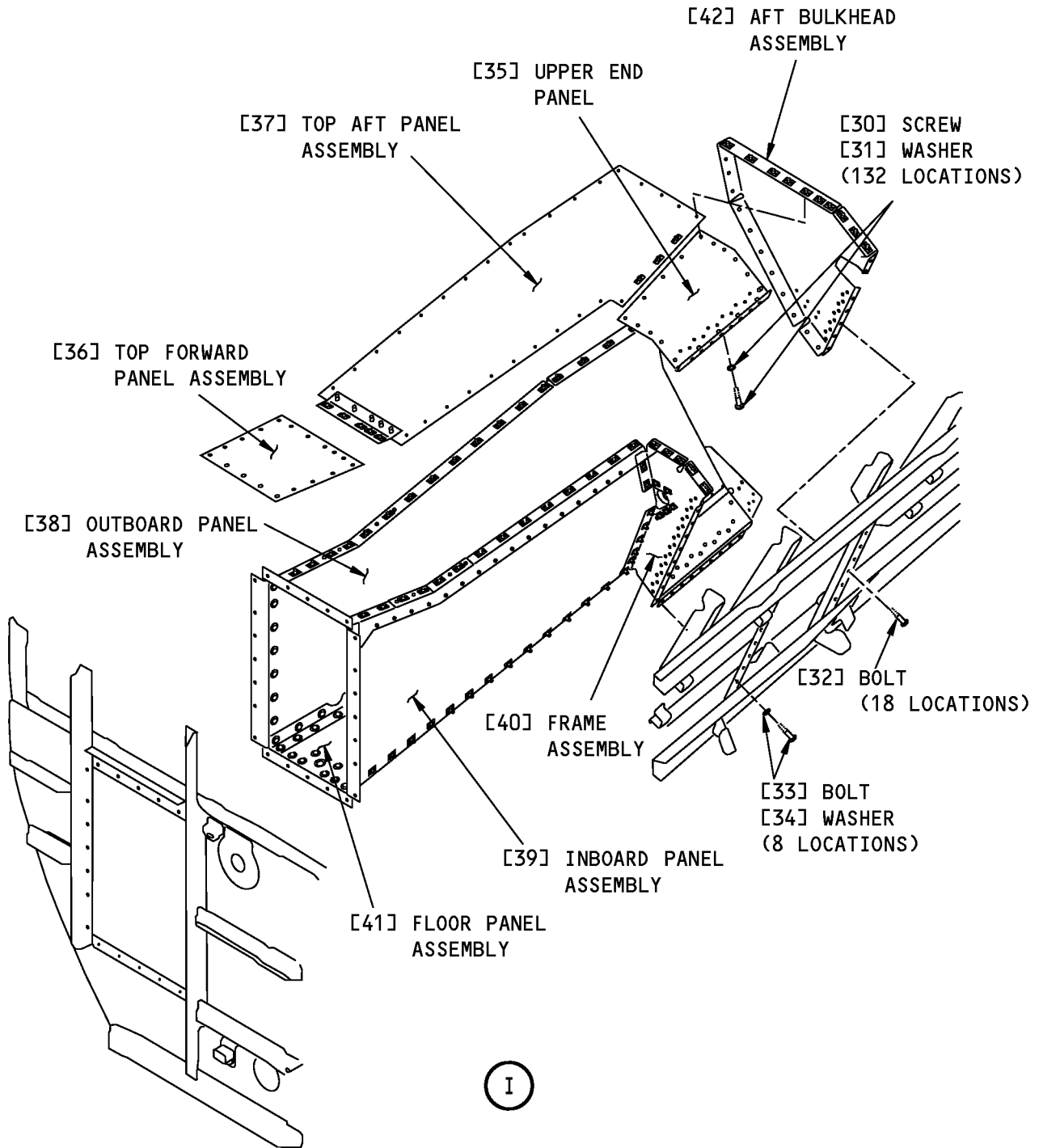
**Air Inlet Plenum Removal (8 Piece Inlet Plenum)  
Figure 401 (Sheet 3 of 4)/49-15-15-990-801**

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**Air Inlet Plenum Removal (8 Piece Inlet Plenum)  
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HAP 001-013, 015-026, 028-030 (Continued)

#### TASK 49-15-15-400-801

### 3. Air Inlet Plenum Installation (8 Piece Inlet Plenum)

(Figure 401)

#### A. References

Reference	Title
27-31-00-800-801	Elevator Hydraulic System A and B - Pressurization (P/B 201)
49-11-00-400-801	APU Power Plant Installation (P/B 401)
49-17-11-400-801	Insulation Panel Installation (P/B 401)

#### B. Tools/Equipment

Reference	Description
STD-764	Scraper - Non-metallic
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

#### C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
A50103	Sealant - Pressure And Environmental-Chromate, Type II, Class B-2	BMS 5-95, Type II Class B-2
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

#### D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Gasket	49-15-00-03-020	HAP 001-013, 015-026, 028-030
4	Gasket	49-15-00-03-050	HAP 001-013, 015-026, 028-030
42	Aft Bulkhead Assembly	49-15-00-01-325	HAP 001-013, 015-026, 028-030

#### E. Location Zones

Zone	Area
311	Area Aft of Pressure Bulkhead - Left
314	Stabilizer Torsion Box Compartment - Right
316	APU Compartment - Right

#### F. Prepare for the Installation

SUBTASK 49-15-15-100-001

(1) Do these steps before you install the Air Inlet Plenum panels:

(a) If you see remaining sealant on the Air Inlet Plenum panels, then do these steps:

- 1) Remove the remaining sealant from the surface with a non-metallic scraper, STD-764 or an equivalent tool.
- 2) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.

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- 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.

NOTE: It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

### G. Install the Air Inlet Plenum

SUBTASK 49-15-15-400-001

#### (1) Do these steps to install the Air Inlet Plenum:

- (a) Apply sealant, A50103 to the mating surface of the Aft Bulkhead Assembly [42] and APU compartment wall.
- (b) Install the Aft Bulkhead Assembly [42] with the eight Bolts [32].
- (c) Position the Outboard Panel Assembly [38] inside the Air Inlet Plenum Area.
- (d) Apply sealant, A50103 to the mating surface of the Floor Panel Assembly [41] and APU compartment wall, Station 1088 Bulkhead, and Drain Tube Bracket.
- (e) Install the Floor Panel Assembly [41] with the five Bolts [32] at the aft edge, eight Screws [30], and eight Washers [31] at the forward edge, and two Screws [30] and two Washers [31] that attach it to the Aft Bulkhead Assembly [42].
- (f) Apply sealant, A50103 to the mating surface of the Frame Assembly [40] and the APU compartment wall.
- (g) Install the Frame Assembly [40] with the eight Bolts [33] that attach it to the APU compartment wall and two Screws [30] and two Washers [31] that attach it to the Floor Panel Assembly [41].
- (h) Apply sealant, A50103 to the mating surface of the Inboard Panel Assembly [39] and the Station 1088 Bulkhead.
- (i) Install the Inboard Panel Assembly [39] with the seven Screws [30] and seven Washers [31] that attach it to the Station 1088 Bulkhead, the 15 Screws [30] and 15 Washers [31] that attach it to the Floor Panel Assembly [41], and the seven Screws [30] and Washers [31] that attach it to the Frame Assembly [40].
- (j) Apply sealant, A50103 to the mating surface of the Outboard Panel Assembly [38] and the Station 1088 Bulkhead.
- (k) Install the Outboard Panel Assembly [38] with the seven Screws [30] and seven Washers [31] that attach it to the Station 1088 Bulkhead, the 15 Screws [30] and 15 Washers [31] that attach it to the Floor Panel Assembly [41], and the nine Screws [30] and nine Washers [31] that attach it to the Aft Bulkhead Assembly [42].
- (l) Install the Top Aft Panel Assembly [37] with the 14 Screws [30] and 14 Washers [31] that attach it to the Outboard Panel Assembly [38], the 10 Screws [30] and 10 Washers [31] that attach it to the Inboard Panel Assembly [39], and the three Screws [30] and three Washers [31] that attach it to the Aft Bulkhead Assembly [42].
- (m) Apply sealant, A50103 to the mating surface of the Top Forward Panel Assembly [36] and the Station 1088 Bulkhead.
- (n) Install the Top Forward Panel Assembly [36] with the 18 Screws [30] and 18 Washers [31].
- (o) Apply sealant, A50103 to the mating surface of the Upper End Panel [35] and the APU compartment wall.

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- (p) Install the Upper End Panel [35] with the five Bolts [32] that attach it to the APU compartment wall and the 14 Screws [30] and 14 Washers [31].

SUBTASK 49-15-15-400-002

- (2) Do these steps to attach the Cable Guard Tube to the Air Inlet Plenum:
- (a) Apply sealant, A50103 to the mating surface of the Cover Plate Assembly [28] and the Aft Bulkhead Assembly [42].
  - (b) Install the aft Cover Plate Assembly [28], Cover Plate Assembly [27], Cover Plate [26], and Bracket [25] with the four Bolts [23] and four Washers [24].
    - 1) Maintain a 0.01 in. (0.25 mm) to 0.63 in. (16.00 mm) gap between the Cover Plate Assembly [27], Cover Plate [26] and the Cable Guard Tube.
  - (c) Install the Upper Plate [21], Lower Plate [22], Doubler [20], and Bracket [19] with the five Bolts [17] and five Washers [18].
    - 1) Maintain a 0.01 in. (0.25 mm) to 0.63 in. (16.00 mm) gap between the Cover Plate Assembly [27], Cover Plate [26] and the Cable Guard Tube.
  - (d) Apply sealant, A00160 to all joints, reliefs, and corners of the inside of the Air Inlet Plenum.
  - (e) Install the Clamps [43] with the four Screws [44], eight Washers [45], and four Nuts [46].

SUBTASK 49-15-15-400-003

- (3) Do these steps to install the Air Inlet Adapter:
- (a) Apply sealant, A00160 to the mating surface of the Inlet Adapter Assembly [10] and the Air Inlet Plenum.
  - (b) Install the Inlet Adapter Assembly [10] with the seven Bolts [11] and seven Washers [12] on the forward edge, and the seven Bolts [15] and seven Washers [16] on the aft edge.
  - (c) Apply sealant, A00160 into the gaps at the corners of the Inlet Adapter Assembly [10] and the Air Inlet Plenum.

SUBTASK 49-15-15-400-004

- (4) Do these steps to install the Transition Duct [2]:
- (a) Install the Transition Duct [2] to the Air Inlet Plenum with the new Gasket [4] , 24 Bolts [8], and 24 Washers [9].

SUBTASK 49-15-15-400-005

- (5) Do these steps to install the Diffuser Duct [1]:
- (a) Install the Diffuser Duct [1] to the Transition Duct [2] with the new Gasket [3], 26 Bolts [7], 26 Washers [6], and 26 Nuts [5].
  - (b) Apply sealant, A00160 to the gap between the Diffuser Duct [1] and the Air Inlet Door. The sealant must be flush with the duct walls.

### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-15-15-410-001

- (1) Install the forward right, aft right, and upper APU compartment firewall insulation panels. To install them, do this task: Insulation Panel Installation, TASK 49-17-11-400-801.

SUBTASK 49-15-15-410-002

- (2) Install the APU. To install it, do this task: APU Power Plant Installation, TASK 49-11-00-400-801.

SUBTASK 49-15-15-440-001

- (3) Do this task: Elevator Hydraulic System A and B - Pressurization, TASK 27-31-00-800-801.

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HAP 001-013, 015-026, 028-030 (Continued)

SUBTASK 49-15-15-440-002

(4) Set the FLT CONTROL A and B switches to ON.

SUBTASK 49-15-15-440-003

(5) Remove the DO-NOT-MOVE tag from the control column.

END OF TASK

## I HAP 031-054, 101-999

### TASK 49-15-15-000-802

#### 4. Air Inlet Plenum Removal (3 Piece Inlet Plenum)

(Figure 402)

##### A. References

Reference	Title
27-09-14 P/B 201	FLIGHT CONTROLS CABLES - MAINTENANCE PRACTICES
27-31-00-800-802	Remove Pressure from the Elevator Hydraulic Systems A and B (P/B 201)
49-11-00-000-801	APU Power Plant Removal (P/B 401)
49-17-11-000-801	Insulation Panel Removal (P/B 401)

##### B. Tools/Equipment

Reference	Description
STD-764	Scraper - Non-metallic

##### C. Location Zones

Zone	Area
311	Area Aft of Pressure Bulkhead - Left
314	Stabilizer Torsion Box Compartment - Right
316	APU Compartment - Right

##### D. Prepare for the removal

SUBTASK 49-15-15-040-004

(1) Position the control column in the neutral position and place a DO-NOT-MOVE tag on the control column.

SUBTASK 49-15-15-040-005

(2) Set the FLT CONTROL A and B switches to OFF.

SUBTASK 49-15-15-040-006

(3) Do this task: Remove Pressure from the Elevator Hydraulic Systems A and B, TASK 27-31-00-800-802.

SUBTASK 49-15-15-010-001

(4) Remove the APU. To remove it, do this task: APU Power Plant Removal, TASK 49-11-00-000-801

SUBTASK 49-15-15-010-002

(5) Remove the forward right, aft right, and upper APU compartment firewall insulation panels. To remove them, do this task: Insulation Panel Removal, TASK 49-17-11-000-801

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HAP 031-054, 101-999 (Continued)

SUBTASK 49-15-15-030-001

- (6) Disconnect the right hand elevator control cable. To disconnect it, do this task: FLIGHT CONTROLS CABLES - MAINTENANCE PRACTICES, PAGEBLOCK 27-09-14/201

### E. Air Inlet Plenum Removal

SUBTASK 49-15-15-020-001

- (1) Do these steps to remove the Diffuser Duct [1]:
- (a) Remove the 26 Nuts [48], 26 Washers [49], and 26 Bolts [50] that attach the Diffuser Duct [1] to the Plenum Assembly [47].
  - (b) Remove the Diffuser Duct [1].
  - (c) Remove and discard the Gasket [3].

SUBTASK 49-15-15-020-002

- (2) Do these steps to remove the Inlet Adapter Assembly [51]:
- (a) Remove the 14 Bolts [52] and 14 Washers [53] that attach the Inlet Adapter Assembly [51] to the Aft Plenum Assembly [62].
  - (b) Remove the Inlet Adapter Assembly [51].

SUBTASK 49-15-15-000-009

- (3) Do these steps to remove the Air Inlet Plenum:
- (a) Remove the eight Screws [56] and eight Washers [57] that attach the Access Cover [55] to the APU compartment wall.
  - (b) Disconnect the Inlet Plenum Drain Tube [54] from the Plenum Assembly [47].
  - (c) Remove the sealant from the inner surface of the Plenum Assembly [47] and interface of the Interconnect Frame Assembly [60] with a non-metallic scraper, STD-764 or an equivalent tool.
  - (d) Remove the 10 Bolts [58] and 10 Washers [59] that attach the Plenum Assembly [47] to the Station 1088 Bulkhead.
  - (e) Remove the Plenum Assembly [47].
  - (f) Remove the sealant from the Interconnect Frame Assembly [60], the Aft Plenum Assembly [62], and the forward end of the Cable Guard Tube [61] with a non-metallic scraper, STD-764 or an equivalent tool.
  - (g) Remove the 26 Screws [64] and 26 Washers [63] that attach the Interconnect Frame Assembly [60] to the Aft Plenum Assembly [62].
  - (h) Remove the Interconnect Frame Assembly [60].
  - (i) Remove the sealant from the aft end of the Cable Guard Tube [61] with a non-metallic scraper, STD-764 or an equivalent tool.
  - (j) Remove the Cable Guard Tube [61].
  - (k) Remove the 18 Bolts [67] and 18 Washers [68] that attach the Aft Plenum Assembly [62] to the APU Compartment Wall.
  - (l) Remove the eight Bolts [65] and eight Washers [66] that attach the Aft Plenum Assembly [62] to the APU Compartment Wall.
  - (m) Remove the Aft Plenum Assembly [62].

————— END OF TASK —————

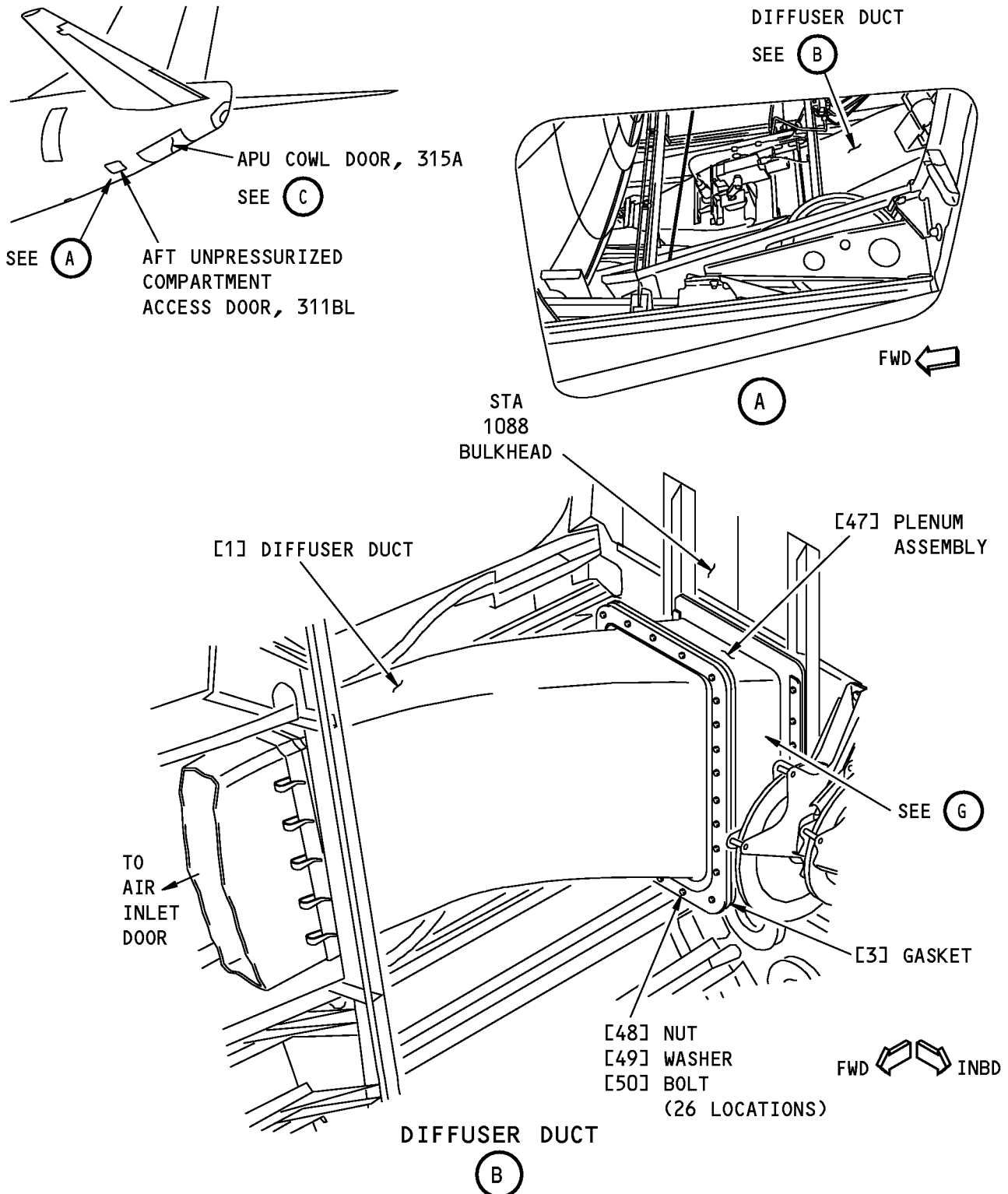
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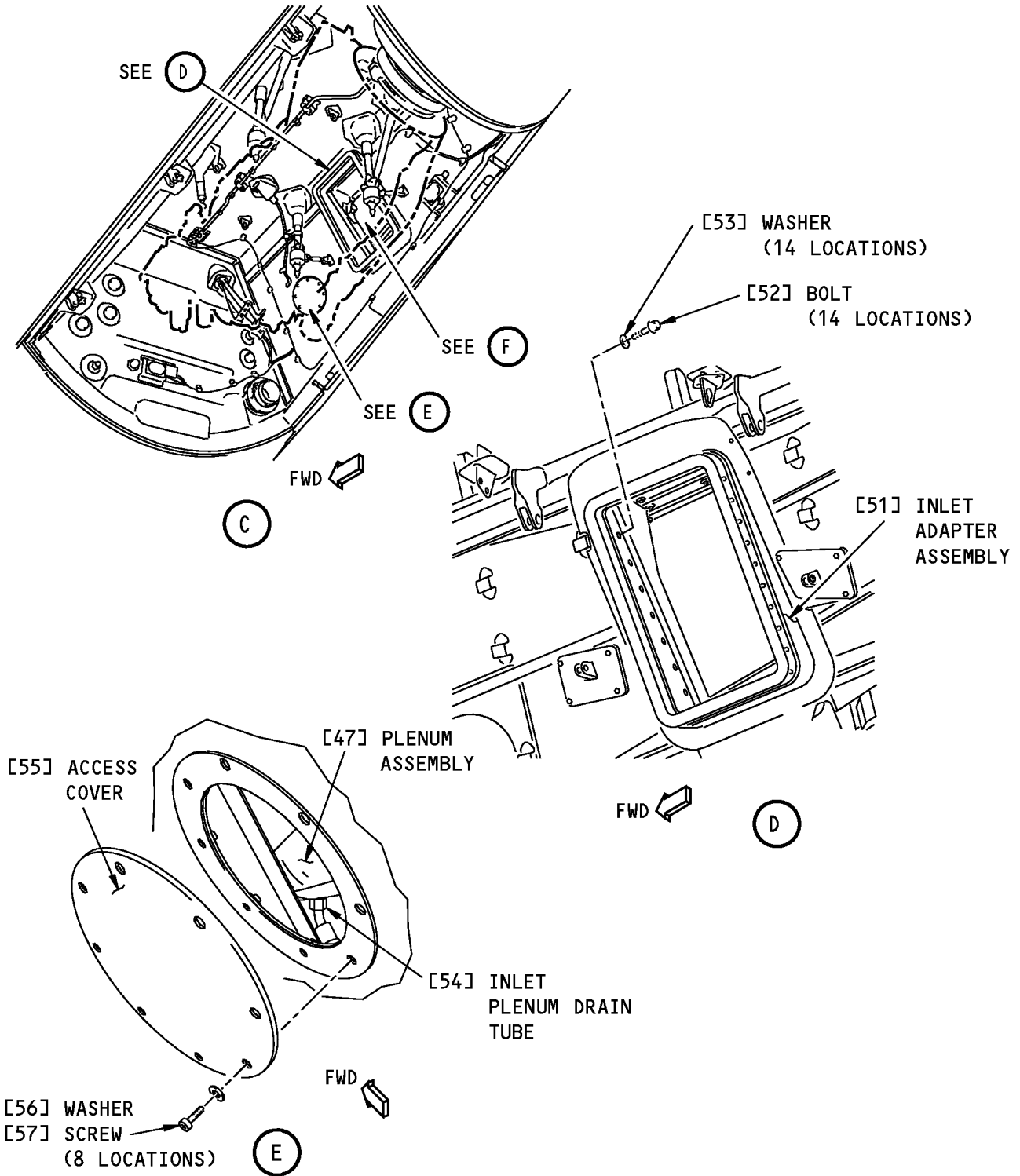
**Air Inlet Plenum Removal (3 Piece Inlet Plenum)**  
**Figure 402 (Sheet 1 of 4)/49-15-15-990-802**

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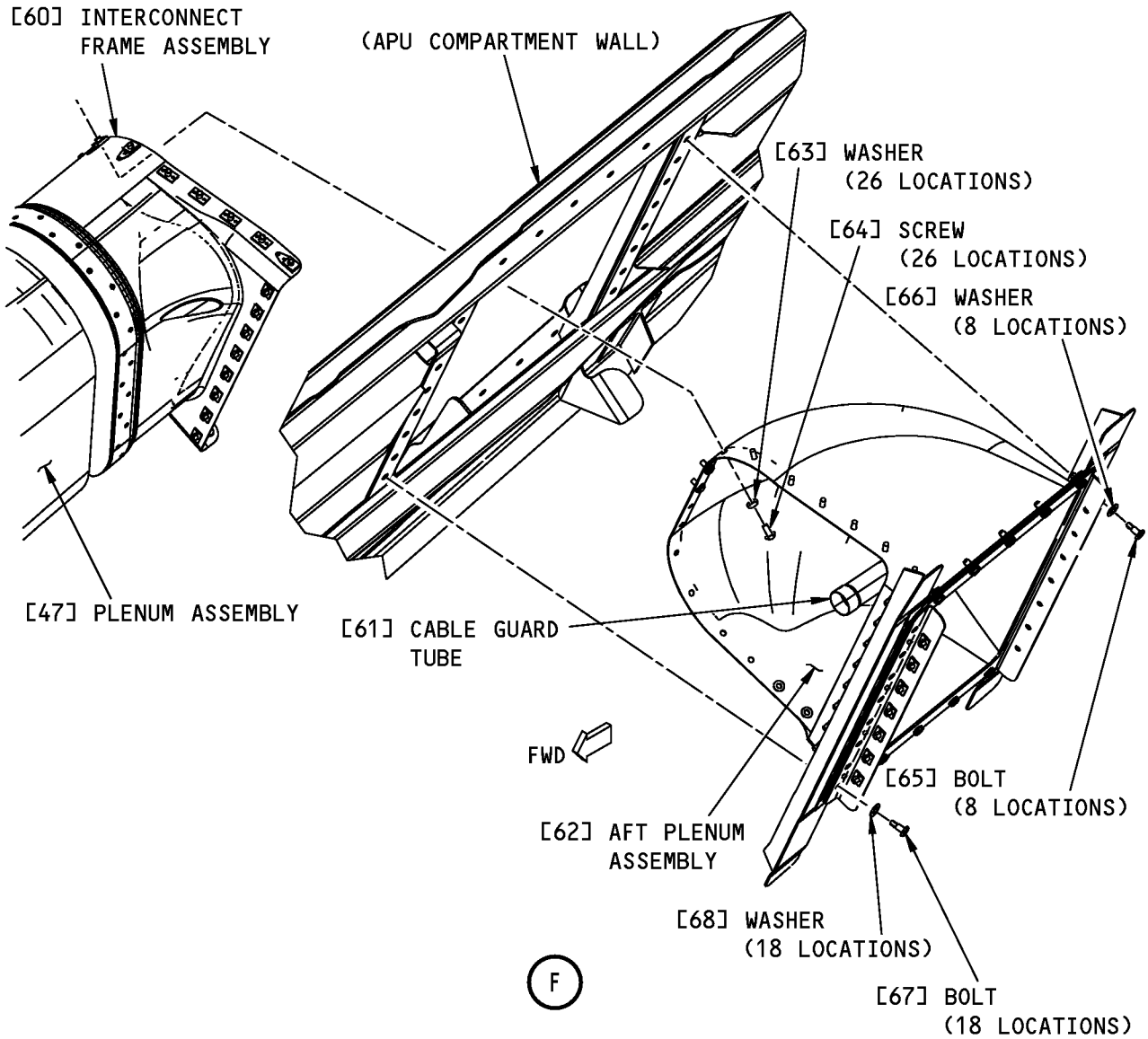
**Air Inlet Plenum Removal (3 Piece Inlet Plenum)  
Figure 402 (Sheet 2 of 4)/49-15-15-990-802**

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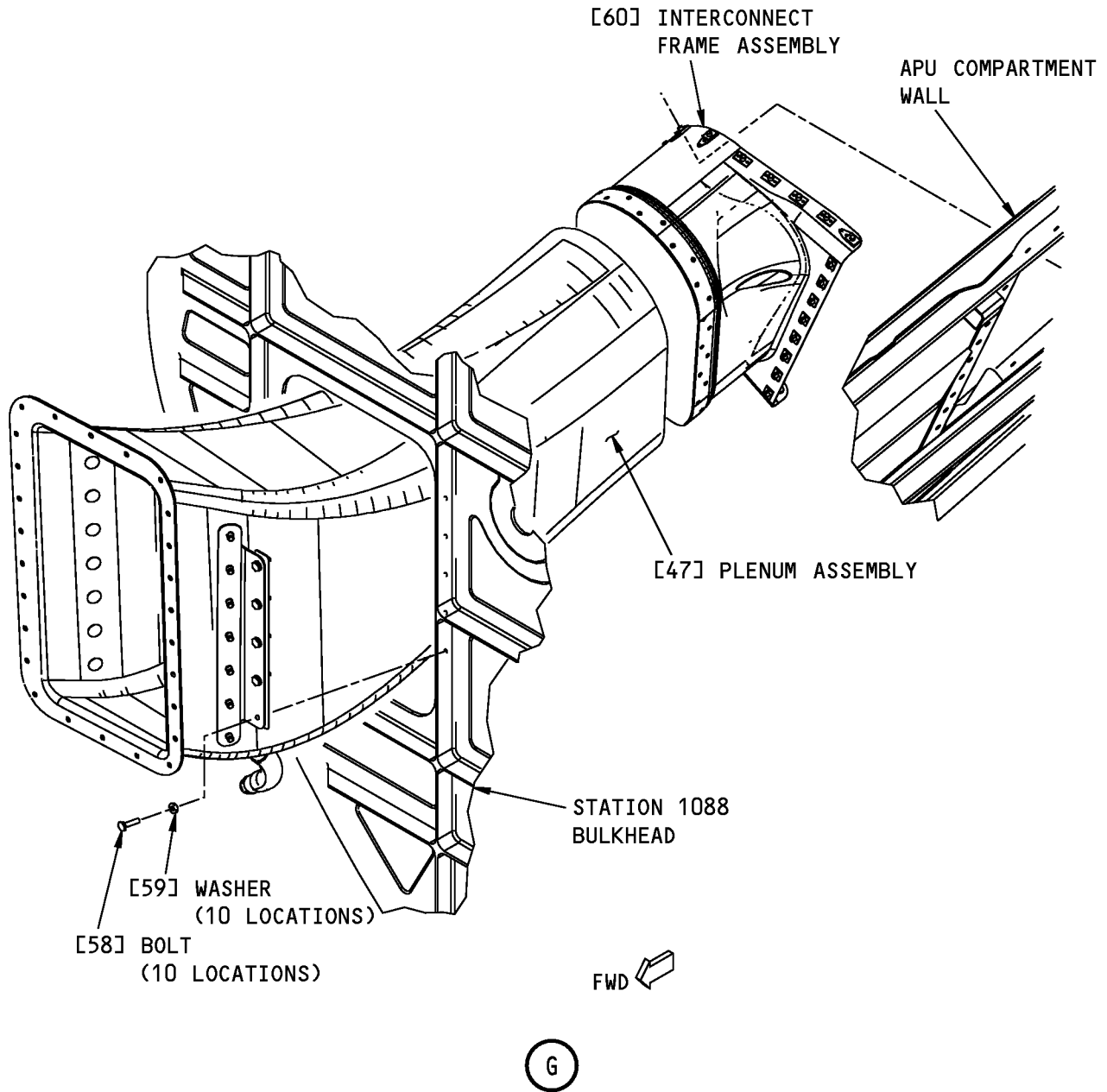
**Air Inlet Plenum Removal (3 Piece Inlet Plenum)  
Figure 402 (Sheet 3 of 4)/49-15-15-990-802**

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**Air Inlet Plenum Removal (3 Piece Inlet Plenum)  
Figure 402 (Sheet 4 of 4)/49-15-15-990-802**

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# AIRCRAFT MAINTENANCE MANUAL

HAP 031-054, 101-999 (Continued)

## TASK 49-15-15-400-802

### 5. Air Inlet Plenum Installation (3 Piece Inlet Plenum)

(inlet plenum Figure 402)

#### A. References

Reference	Title
27-09-14 P/B 201	FLIGHT CONTROLS CABLES - MAINTENANCE PRACTICES
27-31-00-800-801	Elevator Hydraulic System A and B - Pressurization (P/B 201)
49-11-00-400-801	APU Power Plant Installation (P/B 401)
49-17-11-400-801	Insulation Panel Installation (P/B 401)

#### B. Tools/Equipment

Reference	Description
STD-764	Scraper - Non-metallic
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

#### C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

#### D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Gasket	49-15-00-06-020	HAP 031-054, 101-999

#### E. Location Zones

Zone	Area
311	Area Aft of Pressure Bulkhead - Left
314	Stabilizer Torsion Box Compartment - Right
316	APU Compartment - Right

#### F. Prepare for the Installation

SUBTASK 49-15-15-100-002

(1) Do these steps before you install the Air Inlet Plenum parts:

(a) If you see remaining sealant on the Air Inlet Plenum parts, then do these steps:

- 1) Remove the remaining sealant from the surface with a non-metallic scraper, STD-764 or an equivalent tool.
- 2) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.
- 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

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### G. Install the Air Inlet Plenum

SUBTASK 49-15-15-400-006

- (1) Do these steps to install the Air Inlet Plenum:
  - (a) Install the Aft Plenum Assembly [62] with the 18 Bolts [67] and 18 Washers [68] that attach it to the APU Compartment Wall along the top, forward, and bottom sides.
  - (b) Install the eight Bolts [65] and eight Washers [66] that attach the Aft Plenum Assembly [62] to the APU Compartment Wall along the aft side.
  - (c) Apply sealant, A00160 to the mating surfaces of the Cable Guard Tube [61], the Aft Plenum Assembly [62] and the Interconnect Frame Assembly [60].
  - (d) Position the Cable Guard Tube [61] onto the Aft Plenum Assembly [62].
  - (e) Install the Interconnect Frame Assembly [60] onto the Cable Guard Tube [61] and Aft Plenum Assembly [62] with the 26 Screws [64] and 26 Washers [63].
  - (f) Position the right hand Elevator Control Cable through the Cable Guard Tube [61] and Station 1088 Bulkhead.
  - (g) Install the Plenum Assembly [47] with the 10 Bolts [58] and 10 Washers [59] that attach it to the Station 1088 Bulkhead.

NOTE: The aft end of the Plenum Assembly [47] fits inside the forward end of the Interconnect Frame Assembly [60].

- (h) Apply sealant, A00160 to the joint between the Plenum Assembly [47] and the Interconnect Frame Assembly [60].
- (i) Apply sealant, A00160 to the joint between the Interconnect Frame Assembly [60] and the Aft Plenum Assembly [62].
- (j) Connect the Inlet Plenum Drain Tube [54] to the fitting on the bottom of the Plenum Assembly [47].
- (k) Install the Access Cover [55] on the APU Compartment Wall with the eight Screws [56] and eight Washers [57].

SUBTASK 49-15-15-400-007

- (2) Do these steps to install the Air Inlet Adapter:

- (a) Install the Inlet Adapter Assembly [51] with the 14 Bolts [52] and 14 Washers [53] that attach it to the Aft Plenum Assembly [62].

SUBTASK 49-15-15-400-008

- (3) Do these steps to install the Diffuser Duct [1]:

- (a) Install the Diffuser Duct [1] to the Plenum Assembly [47] with the new Gasket [3], 26 Bolts [50], 26 Washers [49], and 26 Nuts [48].
- (b) Apply sealant, A00160 to the gap between the Diffuser Duct [1] and the Air Inlet Door. The sealant must be flush with the duct walls.

### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-15-15-430-001

- (1) Connect the right hand elevator control cable. To connect it, do this task: FLIGHT CONTROLS CABLES - MAINTENANCE PRACTICES, PAGEBLOCK 27-09-14/201

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HAP 031-054, 101-999 (Continued)

SUBTASK 49-15-15-410-003

- (2) Install the forward right, aft right, and upper APU compartment firewall insulation panels. To install them, do this task: Insulation Panel Installation, TASK 49-17-11-400-801.

SUBTASK 49-15-15-410-004

- (3) Install the APU. To install it, do this task: APU Power Plant Installation, TASK 49-11-00-400-801.

SUBTASK 49-15-15-440-004

- (4) Do this task: Elevator Hydraulic System A and B - Pressurization, TASK 27-31-00-800-801.

SUBTASK 49-15-15-440-005

- (5) Set the FLT CONTROL A and B switches to ON.

SUBTASK 49-15-15-440-006

- (6) Remove the DO-NOT-MOVE tag from the control column.

————— **END OF TASK** —————

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# AIRCRAFT MAINTENANCE MANUAL

## AIR INLET DOOR - SERVICING

### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure gives the task to lubricate the parts for the vortex generator.
- C. It is not necessary to remove the vortex generator to do this task.

#### **TASK 49-15-22-600-801**

### 2. Vortex Generator Lubrication

(Figure 301)

#### A. General

- (1) This procedure is a scheduled maintenance task.

#### B. Tools/Equipment

Reference	Description
STD-1242	Hammer - Standard
STD-3906	Mallet - Rubber

#### C. Consumable Materials

Reference	Description	Specification
C00259	Primer - Chemical And Solvent Resistant Finish, Epoxy Resin	BMS10-11, Type I
D00015	Grease - Aircraft Bearing (Use BMS 3-24 until existing stocks are depleted, BMS 3-33 supersedes BMS 3-24)	BMS3-24 (Superseded by BMS 3-33)
D00633	Grease - Aircraft General Purpose	BMS3-33

#### D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Spring pin	49-15-22-01-080	HAP 001-013, 015-026, 028-030
2	Hinge pin	49-15-22-01-085	HAP 001-013, 015-026, 028-030

#### E. Location Zones

Zone	Area
211	Flight Compartment - Left

#### F. Prepare for the Lubrication

SUBTASK 49-15-22-860-005

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-15-22-860-006

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

### G. Procedure

#### HAP 001-013, 015-026, 028-030 PRE SB 737-49-1133

SUBTASK 49-15-22-640-002

- (1) Do these steps to lubricate the hinge pin [2] on the vortex generator:
  - (a) Use a rubber mallet, STD-3906 or standard hammer, STD-1242 and a 1/16 inch diameter drift pin to carefully tap the spring pin [1] from the hinge pin [2].
  - (b) Remove the spring pin [1] that attaches the hinge pin [2] to the vortex generator.
    - 1) Discard the spring pin [1].
  - (c) Remove the hinge pin [2].
  - (d) Fully lubricate the surfaces of the hinge pin [2] with a light coat of grease, D00015 or grease, D00633.
  - (e) Lubricate the inner diameter of the vortex generator flap with a light coat of grease, D00015 or grease, D00633.
  - (f) Lubricate the inner diameter of the hinge bushings with a light coat of grease, D00015 or grease, D00633.
  - (g) Align the vortex generator flap with the hinge bushings on the vortex generator.
  - (h) Install the hinge pin [2].
  - (i) Apply primer, C00259 to the new spring pin [1].
  - (j) Align the spring pin hole on the hinge pin with the spring pin hole on the vortex generator.
  - (k) Use a rubber mallet, STD-3906 or standard hammer, STD-1242 and a 1/16 inch diameter drift pin to carefully tap (install) the spring pin [1] into the vortex generator and hinge pin [2].

#### HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-49-1133

SUBTASK 49-15-22-640-003

- (2) Do these steps to lubricate the parts on the vortex generator:
  - (a) Remove the nut [9], washer [8], two bushings [5], two washers [7], washer [4] and bolt [3] that attaches the vortex generator flap [6] to the vortex generator.
    - 1) If there is wear damage on the two bushings [5], replace the two bushings [5].
  - (b) Fully lubricate the surfaces of the bolt [3] with a light coat of grease, D00015 or grease, D00633.
  - (c) Lubricate the inner diameter of the vortex generator flap [6] with a light coat of grease, D00015 or grease, D00633.
  - (d) Lubricate the inner and outer diameter of the two bushings [5] with a light coat of grease, D00015 or grease, D00633.
  - (e) Align the vortex generator flap [6] to the vortex generator and install the bushing [5], washer [4], bolt [3], two washers [7], bushing [5], washer [8] and nut [9].
    - 1) Tighten the nut [9] to 15-20 inch-pounds (1.7-2.3 newton-meters).

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### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-15-22-860-007

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-15-22-860-008

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

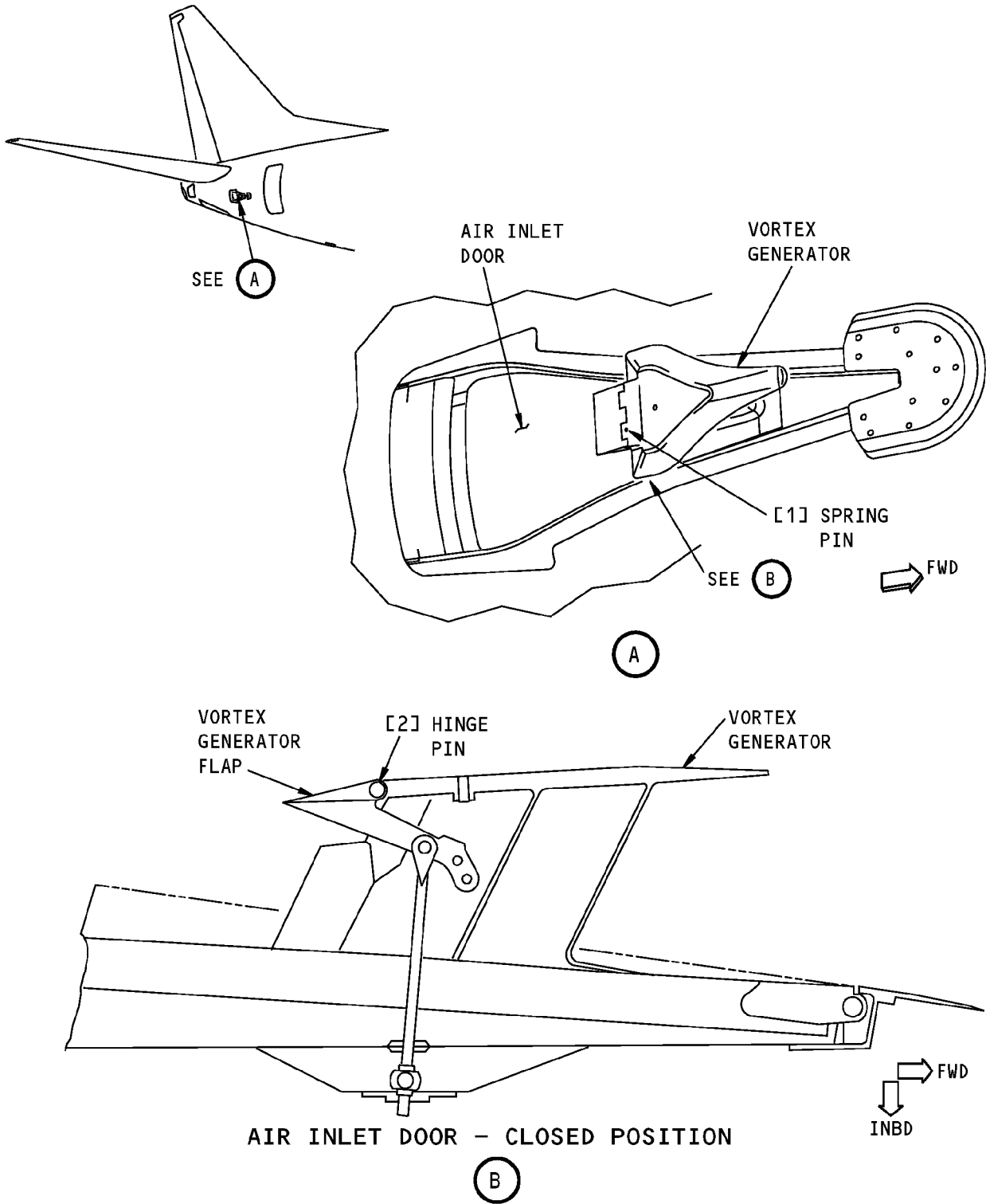
————— **END OF TASK** —————

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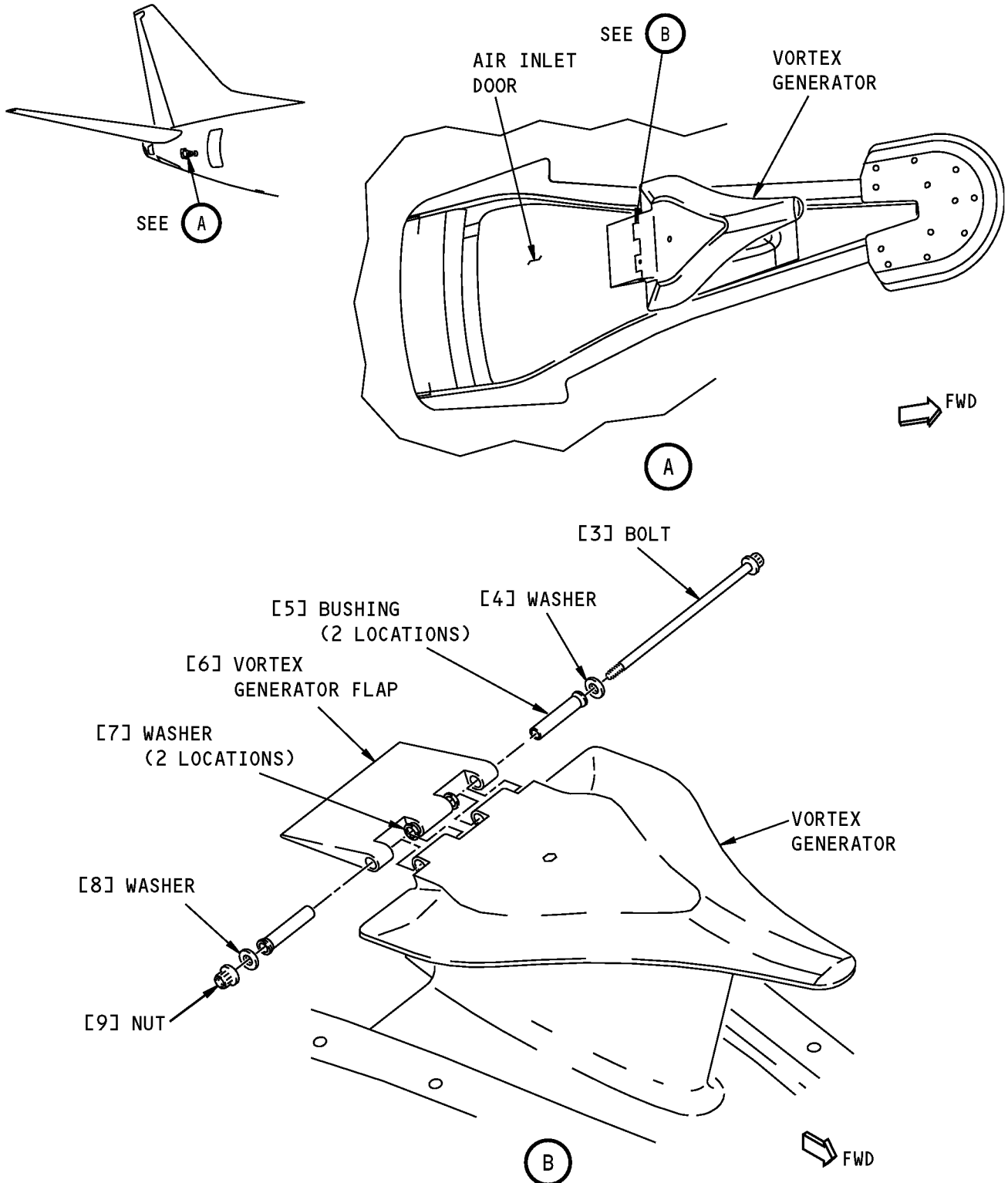


**Air Inlet Door Servicing  
Figure 301 (Sheet 1 of 2)/49-15-22-990-802**

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**Air Inlet Door Servicing  
Figure 301 (Sheet 2 of 2)/49-15-22-990-802**

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# AIRCRAFT MAINTENANCE MANUAL

## AIR INLET DOOR - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the air inlet door
- (2) An installation of the air inlet door.

B. The hinge assembly is removed with the air inlet door. You can remove the hinge assembly after you remove the air inlet door.

#### **TASK 49-15-22-000-801**

### 2. Air Inlet Door Removal

(Figure 401)

A. References

Reference	Title
51-31-00-160-801	Prepare For Sealing (P/B 201)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

C. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

D. Prepare for the Removal

SUBTASK 49-15-22-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-15-22-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-15-22-010-001

- (3) Open this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

E. Air Inlet Door Removal

SUBTASK 49-15-22-020-001

- (1) Do these steps to remove the air inlet door [7] and hinge assembly [12]:

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- (a) Remove the two nuts [2], four washers [3], [6] and two bolts [5] that attach the two pushrod bearings [1] to the two actuator arms.
- (b) Loosen the two locknuts [17] at each end of the two pushrods [4] on the actuator side and remove the two pushrod bearings [1].
- (c) Remove the lockwire that attaches the nut [10] to nut [11].
- (d) Remove the nut [11] from the pushrod [9].
- (e) Remove the sealant that attaches the hinge assembly [12] to the airplane.

NOTE: Use the sealant removal tools from this task: Prepare For Sealing, TASK 51-31-00-160-801, to remove the sealant.

- (f) Remove the 12 screws [8] that attach the hinge assembly [12] to the airplane.

NOTE: You can get access to the screws from the outer side of the airplane.

- (g) While you carefully remove the air inlet door [7] and hinge assembly [12], remove the nut [10] from the pushrod [9].

NOTE: You must remove the nut from the pushrod before the nut touches the grommet. You remove the pushrod from the barrel fitting and grommet.

SUBTASK 49-15-22-020-002

- (2) Do these steps to remove the hinge assembly [12] from the air inlet door [7]:

- (a) Remove the cotter pin [16], four washers [14], [15] and hinge pin [13].

- 1) Discard the cotter pin [16].

- (b) Remove the hinge assembly [12] from the air inlet door [7].

————— END OF TASK —————

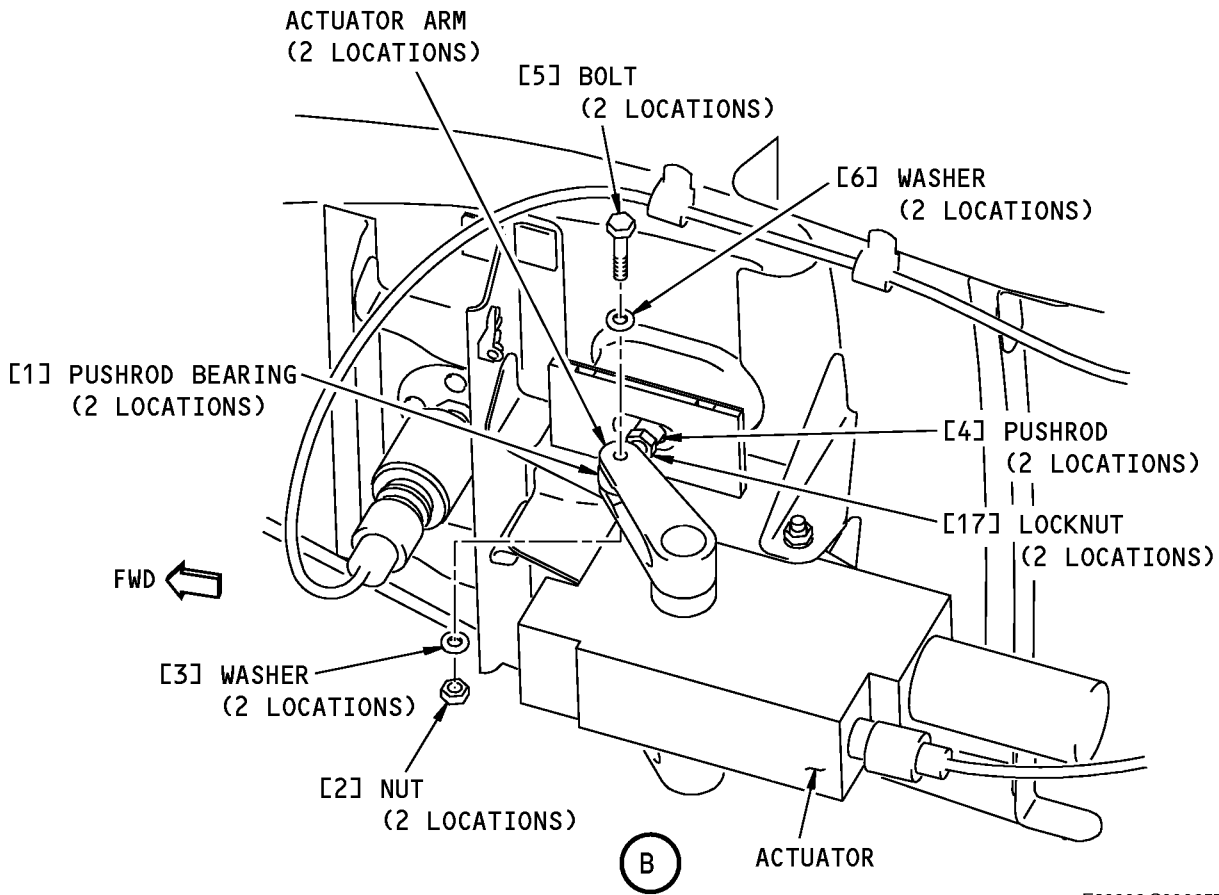
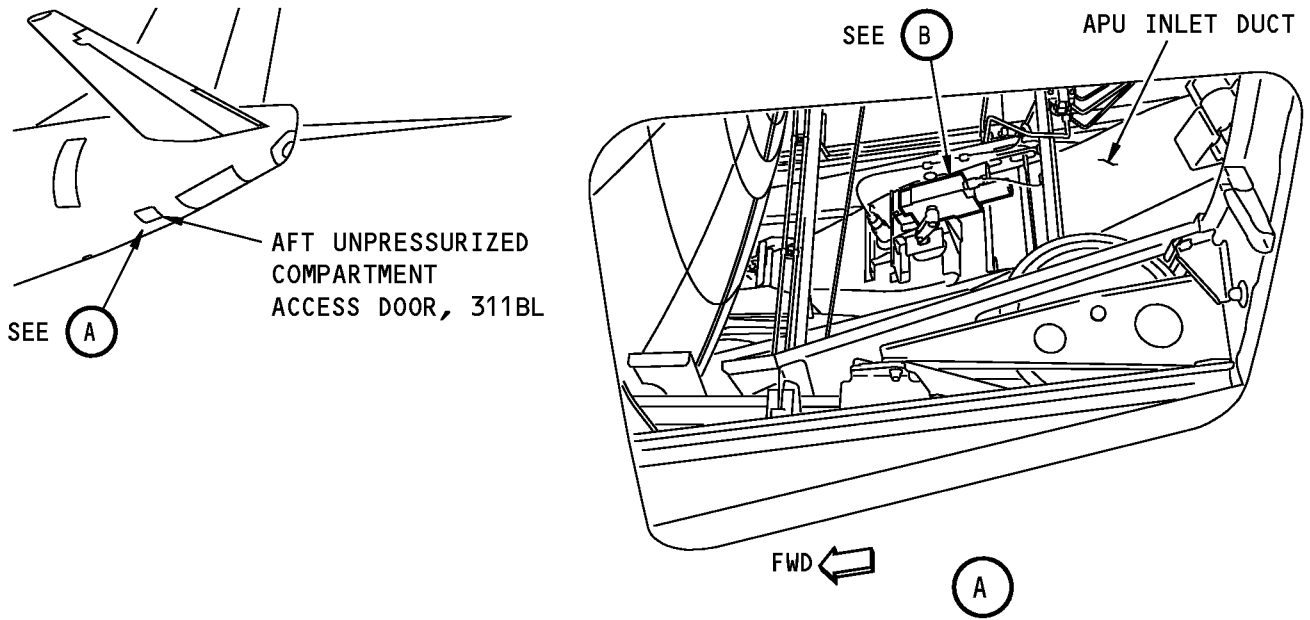
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**Air Inlet Door Installation**  
**Figure 401 (Sheet 1 of 2)/49-15-22-990-801**

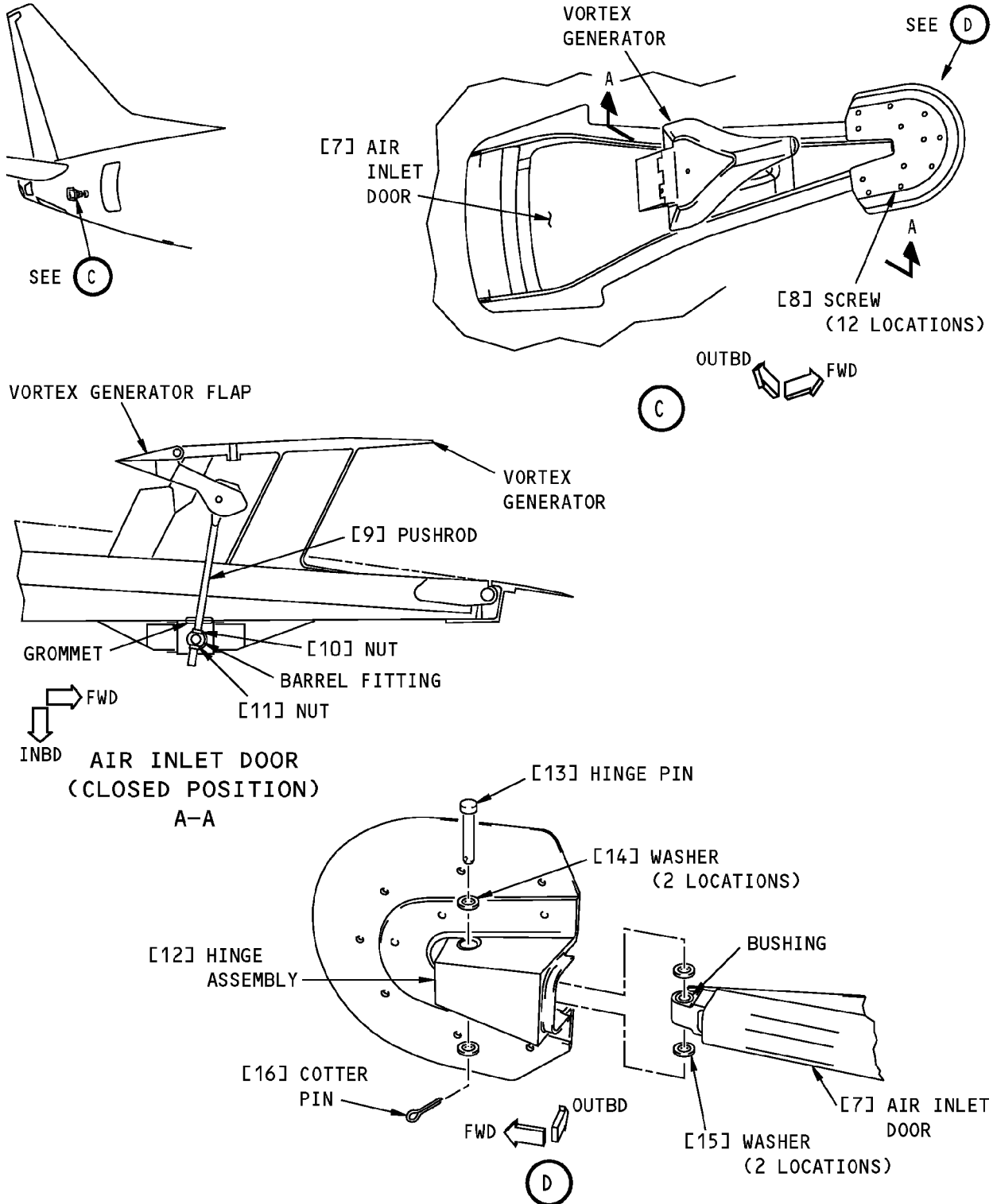
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## TASK 49-15-22-400-801

### 3. Air Inlet Door Installation

(Figure 401)

#### A. References

Reference	Title
49-15-00-800-801	Air Inlet Door Adjustment (P/B 501)
49-15-00-800-803	Vortex Generator Flap Adjustment (P/B 501)
49-15-22-600-801	Vortex Generator Lubrication (P/B 301)
51-31-00-160-801	Prepare For Sealing (P/B 201)
51-31-00-390-806	Aerodynamic Smoother Application (P/B 201)
51-31-00-390-810	Removable Faying (Mated) Surface Seal Application (P/B 201)

#### B. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95
D00015	Grease - Aircraft Bearing (Use BMS 3-24 until existing stocks are depleted, BMS 3-33 supersedes BMS 3-24)	BMS3-24 (Superseded by BMS 3-33)
D00633	Grease - Aircraft General Purpose	BMS3-33

#### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	Air inlet door	49-15-00-02-185	HAP 001-013, 015-026, 028-030
		49-15-00-02A-075	HAP 031-054, 101-999
16	Cotter pin	49-15-00-02-150	HAP 001-013, 015-026, 028-030
		49-15-00-02A-025	HAP 031-054, 101-999

#### D. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

#### E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

#### F. Procedure

SUBTASK 49-15-22-420-001

- (1) Do these steps to install the hinge assembly [12] to the air inlet door [7]:
  - (a) If you see remaining sealant on the parts of the hinge assembly [12] and airplane surfaces, then do this task: Prepare For Sealing, TASK 51-31-00-160-801.
  - (b) Lubricate the hinge pin [13] and the inner diameter of the bushing with a light coat of grease, D00015 or grease, D00633.

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- (c) Install the hinge assembly [12] on the air inlet door [7] with the hinge pin [13] and four washers [14], [15].

NOTE: The hinge pin must be installed with the head up.

- (d) Install the new cotter pin [16] on the hinge pin [13].

SUBTASK 49-15-22-420-002

- (2) Do these steps to install the air inlet door [7] and hinge assembly [12]:

- (a) Carefully install the air inlet door [7] and hinge assembly [12] on the airplane with the 12 screws [8].

NOTE: Do not tighten the 12 screws at this time. You tighten the 12 screws after you install the three pushrods [4], [9].

- (b) Make sure the vortex generator flap moves freely.

- 1) If the vortex generator flap does not move freely, do this task: Vortex Generator Lubrication, TASK 49-15-22-600-801.

- (c) Connect the pushrod [9] to the barrel fitting:

- 1) Carefully put the pushrod [9] through the grommet in the air inlet duct.
- 2) Before you put the pushrod [9] into the barrel fitting, install the nut [10] on the pushrod.

NOTE: The nut goes on the end of the pushrod that has the threads.

- 3) While you install the nut [10], put the pushrod [9] through the barrel fitting.

NOTE: The nut will stop at the top end of the threads.

- 4) Install the nut [11] on the pushrod [9].

NOTE: Do not tighten the nut at this time. You tighten the nut and install the lockwire after you do the task to adjust the vortex generator flap.

- (d) Connect the two pushrods [4] to the two actuator arms:

- 1) Install the two pushrod bearings [1] in the two pushrods [4] on the actuator side and tighten the two locknuts [17].
- 2) Put the two pushrods [4] into the two actuator arms.
- 3) Align the holes of the two pushrod bearings [1] with the two actuator arms.

NOTE: If it is necessary to align the holes of the two pushrod bearings [1] with the two actuator arms, loosen the two locknuts [17], adjust the two pushrod bearings and tighten the two locknuts.

- 4) Install the two bolts [5], four washers [3], [6] and two nuts [2] that attach the two pushrod bearings [1] to the two actuator arms.

- (e) Tighten the 12 screws [8] on the hinge assembly [12].

- (f) Apply a faying seal and fill the gaps with sealant, A00247 between the hinge assembly [12] and the airplane surfaces. To apply a faying seal and fill the gaps, do these tasks: Removable Faying (Mated) Surface Seal Application, TASK 51-31-00-390-810 and Aerodynamic Smoother Application, TASK 51-31-00-390-806.

SUBTASK 49-15-22-410-001

- (3) Close this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

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**G. Air Inlet Door Installation Test**

SUBTASK 49-15-22-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-15-22-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-15-22-820-001

- (3) Do this task: Air Inlet Door Adjustment, TASK 49-15-00-800-801.

SUBTASK 49-15-22-820-002

- (4) Do this task: Vortex Generator Flap Adjustment, TASK 49-15-00-800-803.

**————— END OF TASK —————**

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## VORTEX GENERATOR - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the vortex generator
- (2) An installation of the vortex generator.

B. The vortex generator is installed on the air inlet door. You must remove the air inlet door from the airplane for the removal of the vortex generator.

#### **TASK 49-15-23-000-801**

### 2. Vortex Generator Removal

(Figure 401)

A. References

Reference	Title
49-15-22-000-801	Air Inlet Door Removal (P/B 401)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

C. Vortex Generator Removal

SUBTASK 49-15-23-020-001

(1) Do this task: Air Inlet Door Removal, TASK 49-15-22-000-801.

SUBTASK 49-15-23-020-002

(2) Do these steps to remove the vortex generator [1]:

- (a) Remove the six nuts [7], six washers [10] and six bolts [11] that attach the vortex generator [1] to the air inlet door [8].
- (b) Remove the four nuts [6], four tapered fillers [5], four washers [3] and four bolts [2] that attach the vortex generator [1] to the air inlet door [8].
- (c) Remove the two radius fillers [4], two shims [9] and vortex generator [1] from the air inlet door [8].

————— **END OF TASK** —————

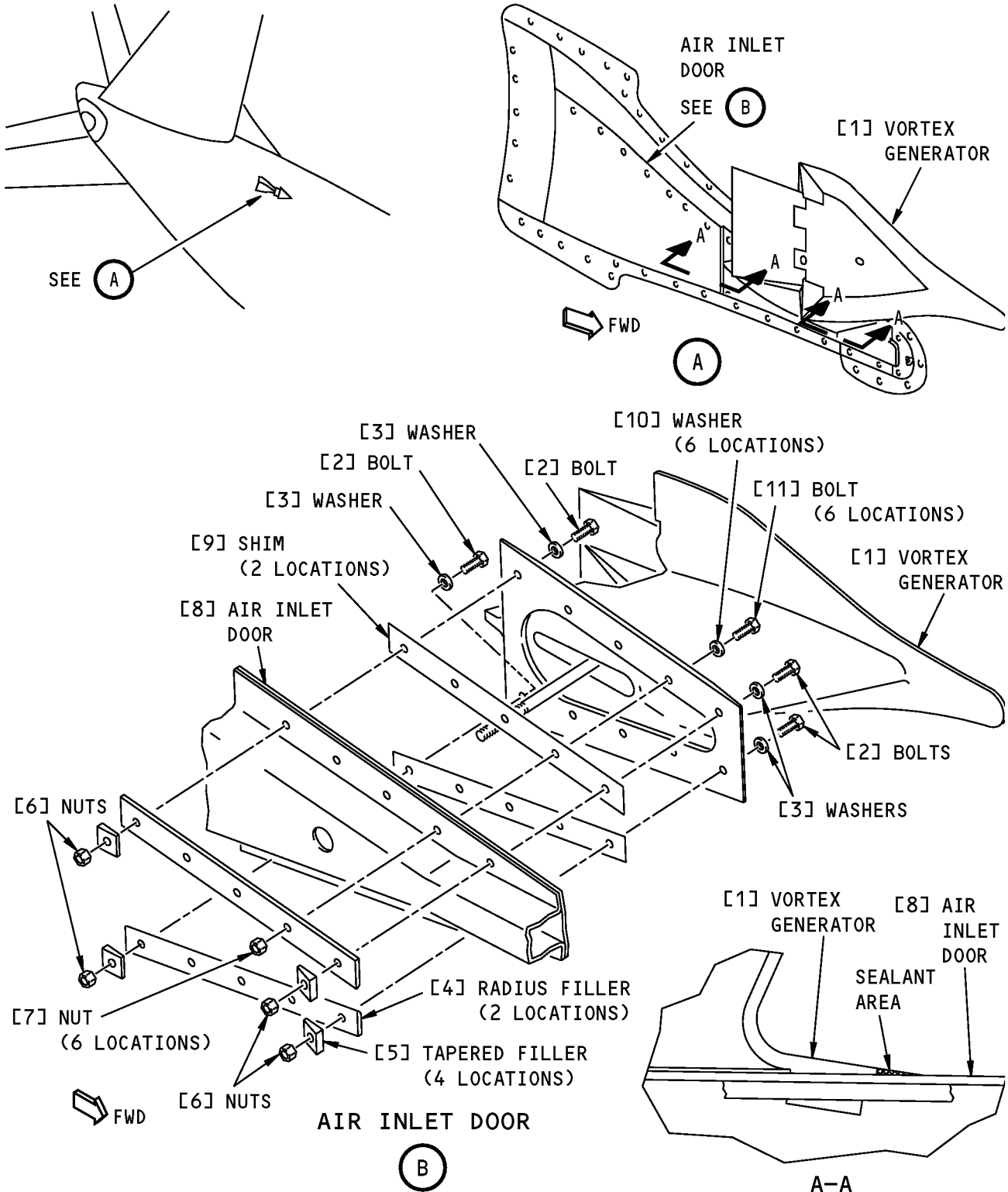
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**Vortex Generator Installation**  
**Figure 401/49-15-23-990-801**

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TASK 49-15-23-400-801

#### 3. Vortex Generator Installation

(Figure 401)

##### A. References

Reference	Title
49-15-22-400-801	Air Inlet Door Installation (P/B 401)

##### B. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1064	Scraper - Phenolic, Hard Resin

##### C. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G01659	Swab - Disposable, Cotton Or Rayon Applicator	GG-A-616

##### D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Generator assembly	49-15-22-01-070	HAP 001-013, 015-026, 028-030
		49-15-22-01A-080	HAP 031-054, 101-999

##### E. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

##### F. Procedure

SUBTASK 49-15-23-420-001

(1) Do these steps to install the generator assembly [1]:

- (a) If you see sealant and/or adhesive on the mating surfaces of the air inlet door [8], vortex generator [1] and two shims [9], then do these steps:
  - 1) Remove the remaining sealant and/or adhesive from the mating surfaces of the air inlet door [8], vortex generator [1] and two shims [9] with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
  - 2) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.
  - 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surfaces of the air inlet door [8], vortex generator [1] and two shims [9].

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surfaces.

- (b) Put the generator assembly [1] without the two shims [9] on the air inlet door [8].

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- (c) If there is a clearance of more than 0.005 inch (0.13 mm) between the generator assembly [1] and air inlet door [8], then do these steps to install the two shims [9]:
- 1) Clean the mating surfaces of the vortex generator [1] and two shims [9] with alcohol, B00130 and a cotton wiper, G00034.
  - 2) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surfaces of the vortex generator [1] and two shims [9].  
**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surfaces of the vortex generator and two shims.
  - 3) Mix the two-part adhesive per the manufacturer's instructions.  
**NOTE:** The pot life of the mixed adhesive is approximately two hours at 68°F-80°F (20°C-26.7°C).
  - 4) Apply a thin and continuous layer of mixed adhesive to the mating surfaces of the two shims [9].
  - 5) Install the two shims [9] on the vortex generator [1].
  - 6) Remove the unwanted mixed adhesive from the two shims [9] and vortex generator [1] with a cotton wiper, G00034 or swab, G01659.
  - 7) Use rubber-tipped clamps or wood strips or equivalent tools to hold the two shims [9] tightly to the vortex generator [1] during the cure time.  
**NOTE:** The cure time for the mixed adhesive is approximately 15-24 hours at 68°F-80°F (20°C-26.7°C).
  - 8) Remove the rubber-tipped clamps, wood strips or equivalent tools from the two shims [9] and vortex generator [1].
- (d) Apply a thin layer of sealant, A00247 to the mating surface of the generator assembly [1].
- (e) Put the generator assembly [1] on the air inlet door [8].
- (f) Install the six bolts [11], six washers [10], two radius fillers [4] and six nuts [7] that attach the generator assembly [1] to the air inlet door [8].
- (g) Install the four bolts [2], four washers [3], four tapered fillers [5] and four nuts [6] that attach the generator assembly [1] to the air inlet door [8].
- (h) Remove the unwanted sealant from the generator assembly [1] and air inlet door [8] with a cotton wiper, G00034 or swab, G01659.
- (i) Use a plastic or metal fairing tool to apply a fillet seal between the forward and aft edges of the generator assembly [1] and air inlet door [8] (view A-A).

SUBTASK 49-15-23-420-002

- (2) Do this task: Air Inlet Door Installation, TASK 49-15-22-400-801.

————— **END OF TASK** —————

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# AIRCRAFT MAINTENANCE MANUAL

## AIR INLET DOOR ACTUATOR - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the air inlet door actuator
- (2) An installation of the air inlet door actuator.

B. The air inlet door actuator is referred to as the actuator.

C. The actuator is installed aft of the rear pressure bulkhead on the inner side of the air inlet door.

### **TASK 49-15-31-000-801**

### 2. Air Inlet Door Actuator Removal

(Figure 401)

A. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

B. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

C. Prepare for the Removal

SUBTASK 49-15-31-860-001

- (1) Make sure the BAT switch on the P5 forward overhead panel is ON.

SUBTASK 49-15-31-860-002

- (2) Set the APU master switch on the P5 forward overhead panel to the ON position and attach a DO-NOT-OPERATE tag.

SUBTASK 49-15-31-860-013

- (3) Make sure the air inlet door opens in approximately 30 seconds.

SUBTASK 49-15-31-860-003

- (4) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-15-31-010-001

- (5) Open this access panel:

Number	Name/Location
311BL	Stabilizer Trim Access Door

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### D. Air Inlet Door Actuator Removal

SUBTASK 49-15-31-020-001

- (1) Do these steps to remove the actuator [11]:
  - (a) Disconnect the electrical connector D922 [6] from the actuator [11].
  - (b) Remove the two nuts [15], four washers [13], [14] and two bolts [12] that attach the two pushrod bearings to the two actuator arms [10].
  - (c) Remove the two nuts [4], four washers [5], [8] and two bolts [9] that attach the actuator [11] to the bracket.
  - (d) Remove the actuator [11] and the laminated shim(s) [7], if installed.

SUBTASK 49-15-31-020-002

- (2) Do these steps to remove the two actuator arms [10]:
  - (a) Remove the two bolts [1], two lockwashers [2] and two washers [3] from the two actuator arms [10].
  - (b) Remove the two actuator arms [10] from the actuator output shaft.
  - (c) Keep the two actuator arms [10] for the installation.

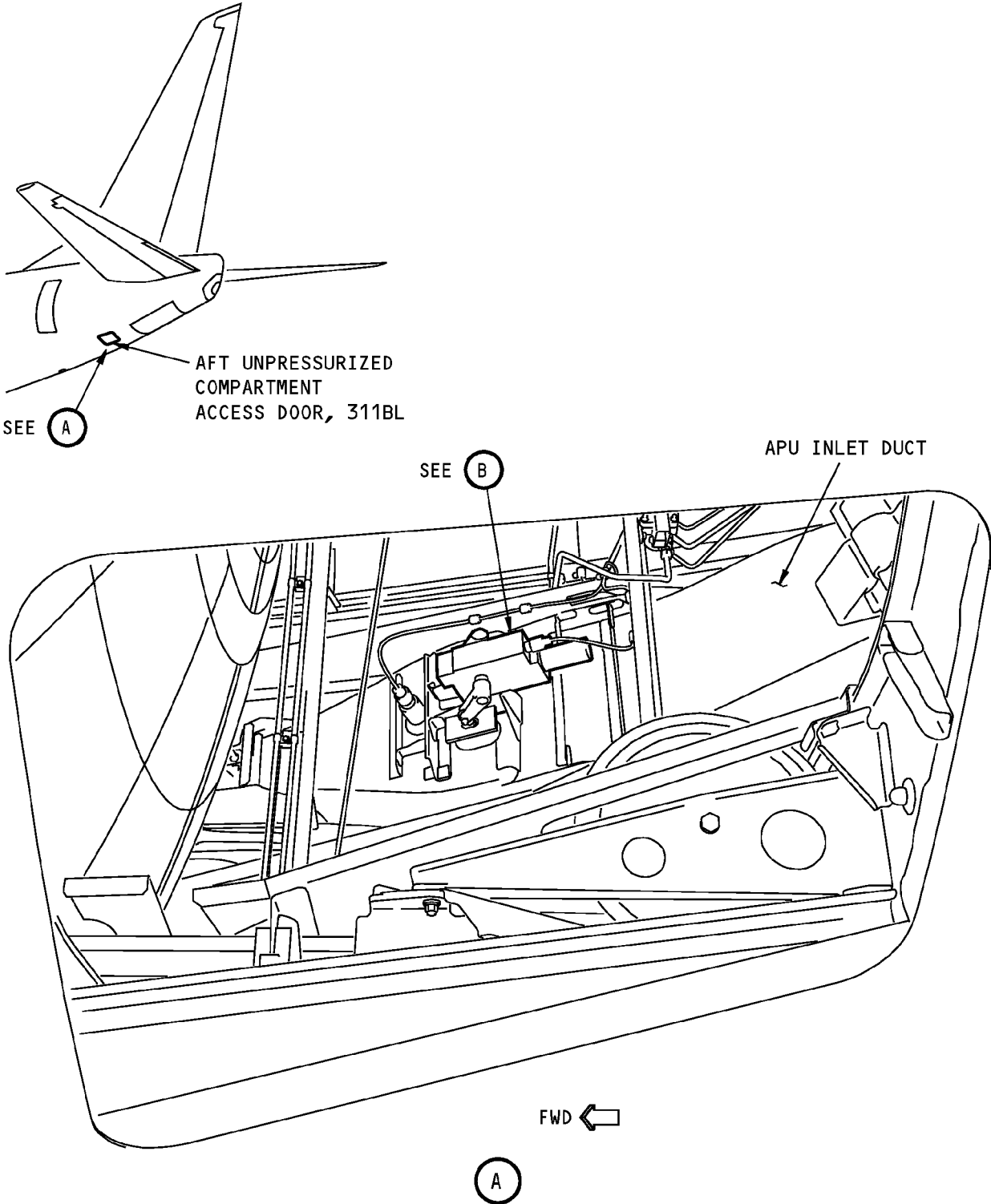
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**Air Inlet Door Actuator Installation  
Figure 401 (Sheet 1 of 2)/49-15-31-990-801**

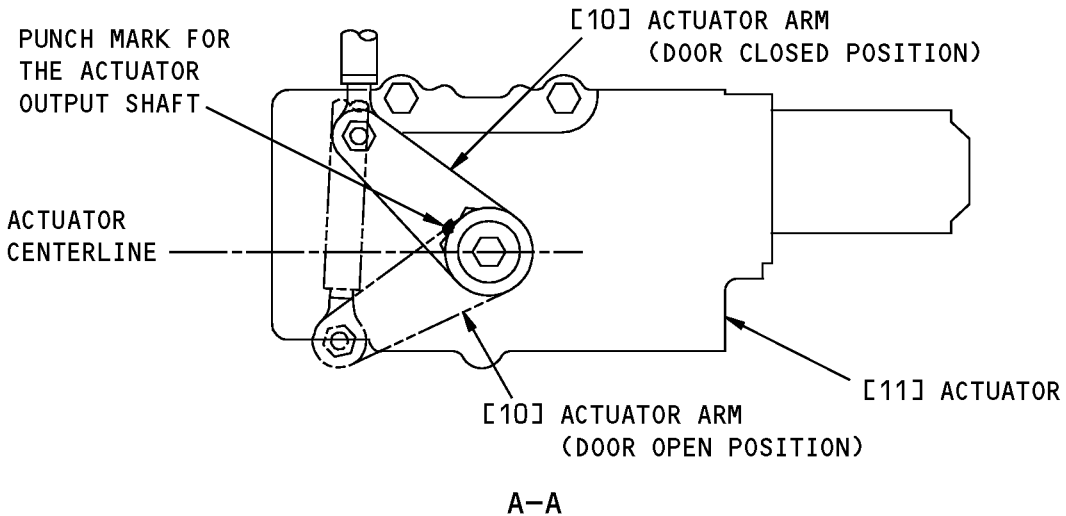
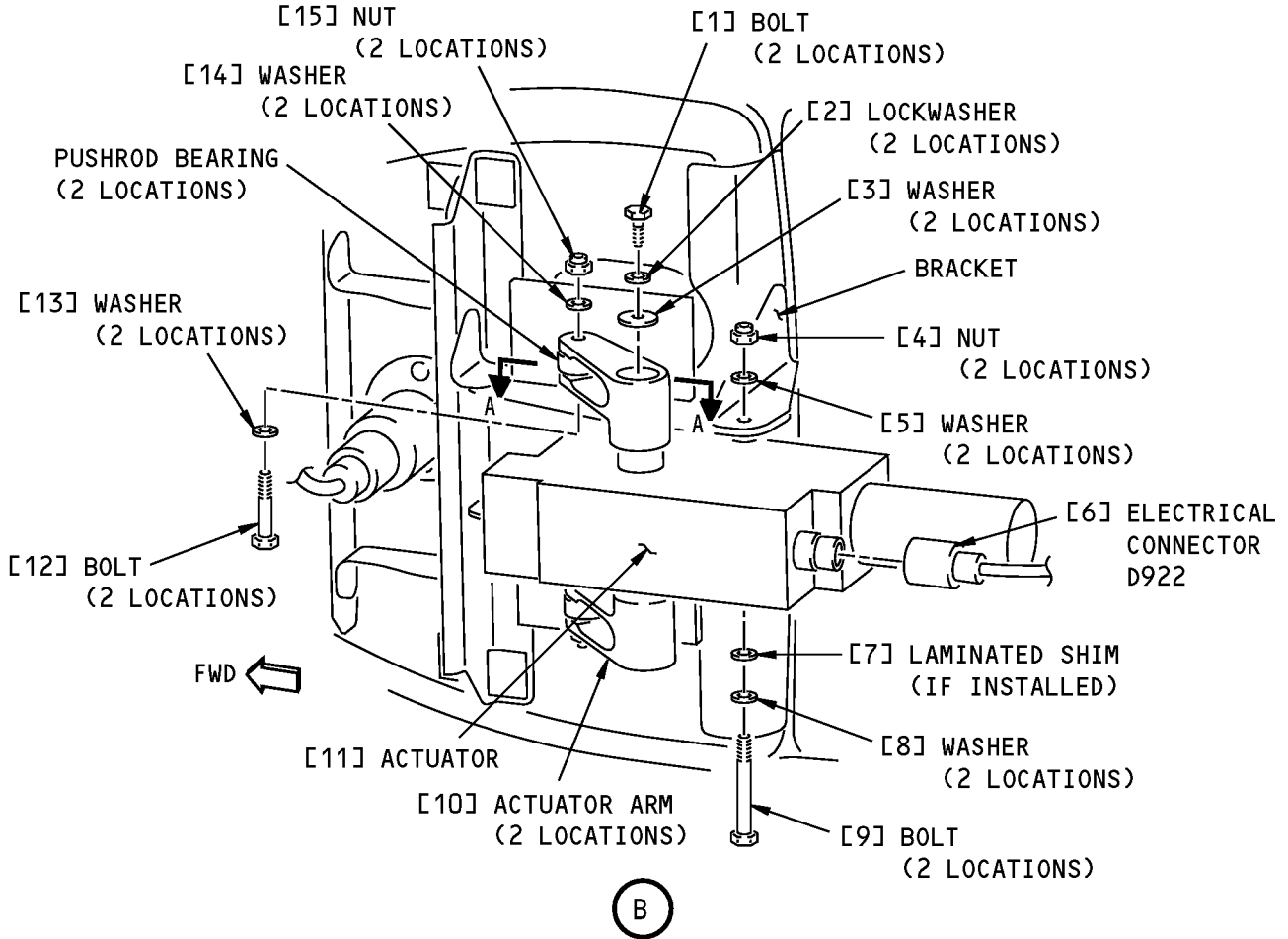
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### AIRCRAFT MAINTENANCE MANUAL

#### TASK 49-15-31-400-801

#### 3. Air Inlet Door Actuator Installation

(Figure 401)

##### A. References

Reference	Title
49-15-00-700-801	Air Inlet Door Test (P/B 501)

##### B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
11	Actuator	49-15-31-01-055	HAP 001-013, 015-026, 028-030
		49-15-31-01A-055	HAP 031-054, 101-999

##### C. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

##### D. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

##### E. Procedure

SUBTASK 49-15-31-420-001

- (1) Do these steps to install the two actuator arms [10] on the actuator [11]:
  - (a) Align the punch mark for the actuator output shaft with the centerline of the two actuator arms [10].
  - (b) Put the two actuator arms [10] on the actuator output shaft.
  - (c) Install the two washers [3], two lockwashers [2] and two bolts [1].
    - 1) Tighten the two bolts [1] to 22-28 pound-inches (2.5-3.2 newton-meters).

SUBTASK 49-15-31-420-002

- (2) Do these steps to install the actuator [11]:
  - (a) Put the actuator [11] on the bracket.
  - (b) If the actuator [11] and the bracket do not touch, add the laminated shim(s) [7] to the actuator as necessary.
 

**NOTE:** Use a 0.0062 inch (0.16 mm) laminated shim.
  - (c) Install the actuator [11] on the bracket with the two bolts [9], four washers [5], [8] and two nuts [4].
  - (d) Put the two pushrod bearings in the two actuator arms [10].
  - (e) Install the two bolts [12], four washers [13], [14] and two nuts [15] that attach the two pushrod bearings to the two actuator arms [10].
  - (f) Connect the electrical connector D922 [6] to the actuator [11].

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SUBTASK 49-15-31-410-002

(3) Make sure this access panel is closed:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

**F. Air Inlet Door Actuator Installation Test**

SUBTASK 49-15-31-860-007

(1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-15-31-860-010

(2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-15-31-860-011

(3) Set the APU master switch to the OFF position.

NOTE: The air inlet door closes in approximately 30 seconds.

SUBTASK 49-15-31-700-001

(4) Do this task: Air Inlet Door Test, TASK 49-15-00-700-801.

————— **END OF TASK** —————

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# AIRCRAFT MAINTENANCE MANUAL

## AIR INLET DOOR POSITION SWITCH - REMOVAL/INSTALLATION

### 1. General

- A. This procedure has these tasks:
  - (1) A removal of the air inlet door position switch
  - (2) An installation of the air inlet door position switch.
- B. The air inlet door position switch is referred to as the door position switch.
- C. The door position switch is installed aft of the rear pressure bulkhead on the inner side of the air inlet door.

### **TASK 49-15-41-000-801**

### 2. Air Inlet Door Position Switch Removal

(Figure 401)

#### A. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Door position switch	49-15-41-01-010	HAP 001-013, 015-026, 028-030
		49-15-41-01A-010	HAP 031-054, 101-999

#### B. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

#### C. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

#### D. Prepare for the Removal

SUBTASK 49-15-41-860-001

- (1) Make sure the BAT switch on the P5 forward overhead panel is ON.

SUBTASK 49-15-41-860-002

- (2) Set the APU master switch on the P5 forward overhead panel to the ON position and attach a DO-NOT-OPERATE tag.

SUBTASK 49-15-41-860-011

- (3) Make sure the air inlet door opens in approximately 30 seconds.

SUBTASK 49-15-41-860-003

- (4) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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## AIRCRAFT MAINTENANCE MANUAL

SUBTASK 49-15-41-010-001

(5) Open this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

### E. Air Inlet Door Position Switch Removal

SUBTASK 49-15-41-020-001

(1) Do these steps to remove the door position switch [3]:

- (a) Disconnect the electrical connector D1246 [4] from the door position switch [3].
- (b) Remove the four screws [2] that attach the baseplate [8] to the inlet door housing.
- (c) Remove the door position switch [3] and baseplate [8] from the inlet door housing.
- (d) Remove the lockwire, nut [1] and lockwasher [7] that attach the door position switch [3] to the baseplate [8].
- (e) Remove the door position switch [3] from the baseplate [8].
- (f) If it is necessary to replace the door position switch [3], remove the key washer [6] and nut [5].

NOTE: Keep the key washer and nut for the new or serviceable door position switch [3].

- (g) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

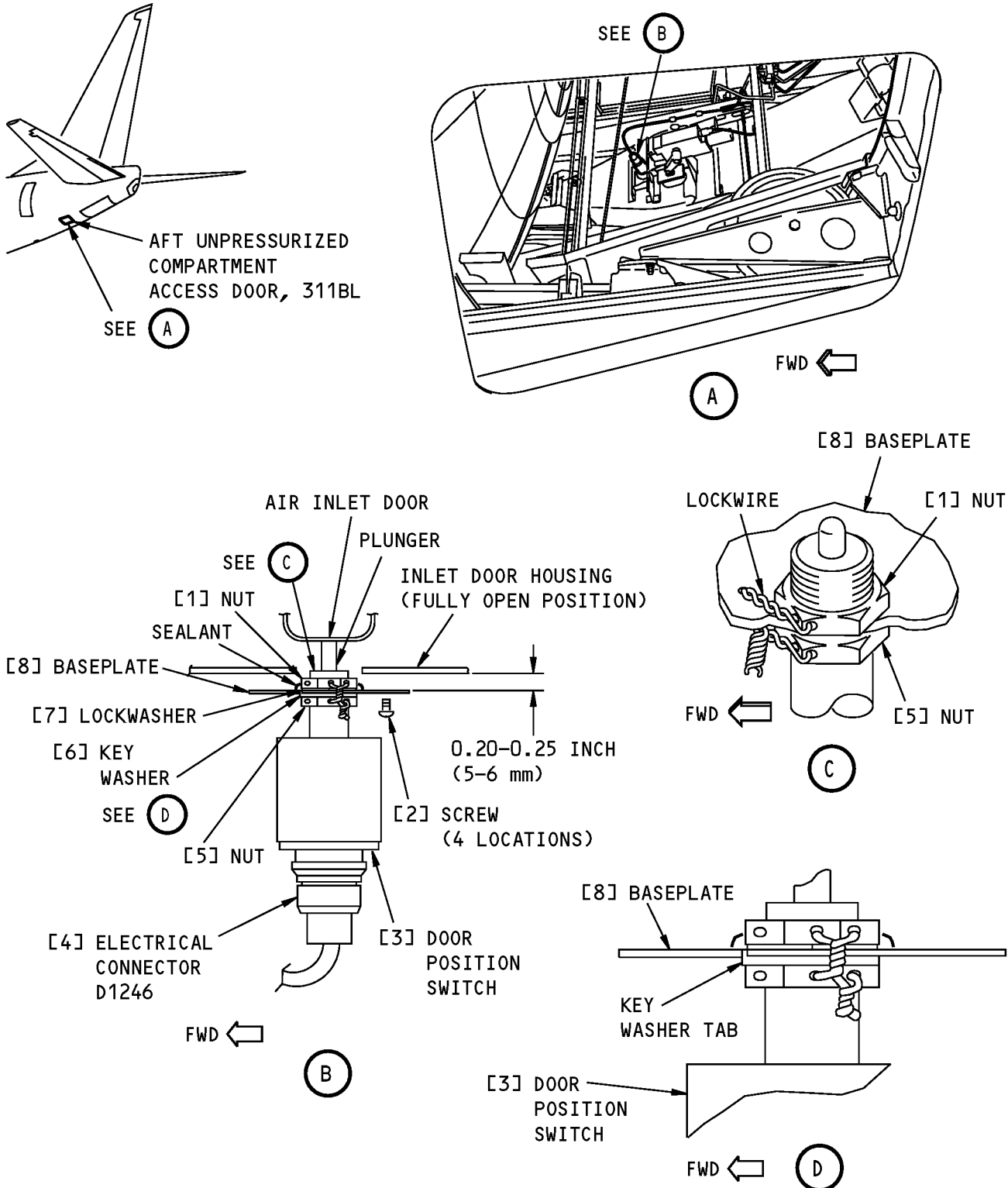
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**Air Inlet Door Position Switch Installation**  
**Figure 401/49-15-41-990-801**

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#### TASK 49-15-41-400-801

#### 3. Air Inlet Door Position Switch Installation

(Figure 401)

##### A. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1064	Scraper - Phenolic, Hard Resin

##### B. Consumable Materials

Reference	Description	Specification
A00142	Sealant - Temperature Resistant, Fuel Pressure, And Weather Sealant	BMS5-44
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G01912	Lockwire - Monel (0.032 In. Dia.)	NASM20995N~ C32 (QQ-N-281)

##### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Door position switch	49-15-41-01-010	HAP 001-013, 015-026, 028-030
		49-15-41-01A-010	HAP 031-054, 101-999

##### D. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

##### E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

##### F. Procedure

SUBTASK 49-15-41-420-001

(1) Do these steps to install the door position switch [3]:

- (a) If you see remaining sealant on the baseplate [8], lockwasher [7] and nut [1], then do these steps:
  - 1) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
  - 2) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
  - 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

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- (b) If the door position switch [3] was replaced, then do these steps to install the nut [5] and key washer [6] on the new or serviceable door position switch:
  - 1) Install the nut [5] on the new or serviceable door position switch [3] with the flat side of the nut on the top side.
  - 2) Put the key washer [6] on the nut [5] with the key washer tab on the top side.
- (c) Loosely install the door position switch [3] on the baseplate [8] with the lockwasher [7] and nut [1].
- (d) Make sure the key washer tab of the key washer [6] is installed in the hole of the baseplate [8] to keep the door position switch [3] in position. See detail D.
- (e) Put the door position switch [3] and baseplate [8] on the inlet door housing.
 

**NOTE:** The plunger for the door position switch [3] must touch the air inlet door. Do not compress the plunger to the air inlet door.
- (f) Turn the two nuts [1], [5] to adjust the position of the door position switch [3] until you can get a clearance between the inlet door housing and the baseplate [8].
 

**NOTE:** The clearance between the bottom of the inlet door housing and the top of the baseplate must be 0.20-0.25 inch (5-6 mm).
- (g) Tighten the nut [1] to 30-40 inch-pounds (3.4-4.5 newton-meters).
- (h) Apply a bead of sealant, A00142, around the lockwasher [7].
- (i) Install the lockwire, G01912, on the two nuts [1], [5].
- (j) Install the baseplate [8] on the inlet door housing with the four screws [2].
- (k) Connect the electrical connector D1246 [4] to the door position switch [3].

#### G. Air Inlet Door Position Switch Installation Test

SUBTASK 49-15-41-860-005

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-15-41-860-008

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-15-41-860-009

- (3) Set the APU master switch to the OFF position.

SUBTASK 49-15-41-860-010

- (4) Make sure the air inlet door closes in approximately 30 seconds.

SUBTASK 49-15-41-860-012

- (5) If it is not necessary to do other tasks, set the BAT switch to the OFF position.

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-15-41-410-001

(1) Close this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

————— **END OF TASK** —————

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## DRAIN MAST - SERVICING

### 1. General

- A. This procedure has the task to do the servicing of the drain mast on the APU cowl door.
- B. There are three witness drain tees to isolate the fuel leakage to the surge control valve, fuel control unit or inlet guide vane (IGV) actuator. The witness drain tee is installed between the drain tube of the component and the forward drain on the APU drain seal.

### **TASK 49-16-11-680-801**

### 2. Drain Mast Servicing

(Figure 301)

#### A. References

Reference	Title
49-31-11-000-801	Fuel Control Unit Removal (P/B 401)
49-31-11-400-801	Fuel Control Unit Installation (P/B 401)
49-52-12-000-801	Inlet Guide Vane (IGV) Actuator Removal (P/B 401)
49-52-12-400-801	Inlet Guide Vane (IGV) Actuator Installation (P/B 401)
49-52-41-000-801	Surge Control Valve Removal (P/B 401)
49-52-41-400-801	Surge Control Valve Installation (P/B 401)

#### B. Tools/Equipment

Reference	Description
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

#### C. Location Zones

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right

#### D. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### E. Prepare for the Servicing of the Drain Mast

SUBTASK 49-16-11-010-002

- (1) Open this APU cowl door. To open this APU cowl door, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU cowl door.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU cowl door.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.

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(g) Install the two retainer pins in the two rod ends.

### F. Procedure

SUBTASK 49-16-11-680-001

**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) Do the servicing of the drain mast [1] on the APU cowl door:

**NOTE:** A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted during an APU operation from the forward drain on the APU drain seal.

(a) Do these steps to isolate the fuel leakage to the surge control valve:

- 1) Put the 1 gallon (4 l) fuel resistant container, STD-4049 below the witness drain tee [2].
- 2) Remove the cap from the witness drain tee [2].
- 3) If you find fuel in the witness drain tee [2], install the cap on the witness drain tee and replace the surge control valve. These are the tasks:
  - Surge Control Valve Removal, TASK 49-52-41-000-801,
  - Surge Control Valve Installation, TASK 49-52-41-400-801.
- 4) If you did not find fuel in the witness drain tee [2], install the cap on the witness drain tee.

(b) Do these steps to isolate the fuel leakage to the fuel control unit:

- 1) Put the 1 gallon (4 l) fuel resistant container, STD-4049 below the witness drain tee [3].
- 2) Remove the cap from the witness drain tee [3].
- 3) If you find fuel in the witness drain tee [3], install the cap on the witness drain tee and replace the fuel control unit. These are the tasks:
  - Fuel Control Unit Removal, TASK 49-31-11-000-801,
  - Fuel Control Unit Installation, TASK 49-31-11-400-801.
- 4) If you did not find fuel in the witness drain tee [3], install the cap on the witness drain tee.

(c) Do these steps to isolate the fuel leakage to the IGV actuator:

- 1) Put the 1 gallon (4 l) fuel resistant container, STD-4049 below the witness drain tee [4].
- 2) Remove the cap from the witness drain tee [4].
- 3) If you find fuel in the witness drain tee [4], install the cap on the witness drain tee and replace the IGV actuator. These are the tasks:
  - Inlet Guide Vane (IGV) Actuator Removal, TASK 49-52-12-000-801,
  - Inlet Guide Vane (IGV) Actuator Installation, TASK 49-52-12-400-801.
- 4) If you did not find fuel in the witness drain tee [4], install the cap on the witness drain tee.
- 5) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

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SUBTASK 49-16-11-410-002

(2) Close this APU cowl door. To close this APU cowl door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU cowl door.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU cowl door.
- (g) Close the three latches.

————— END OF TASK —————

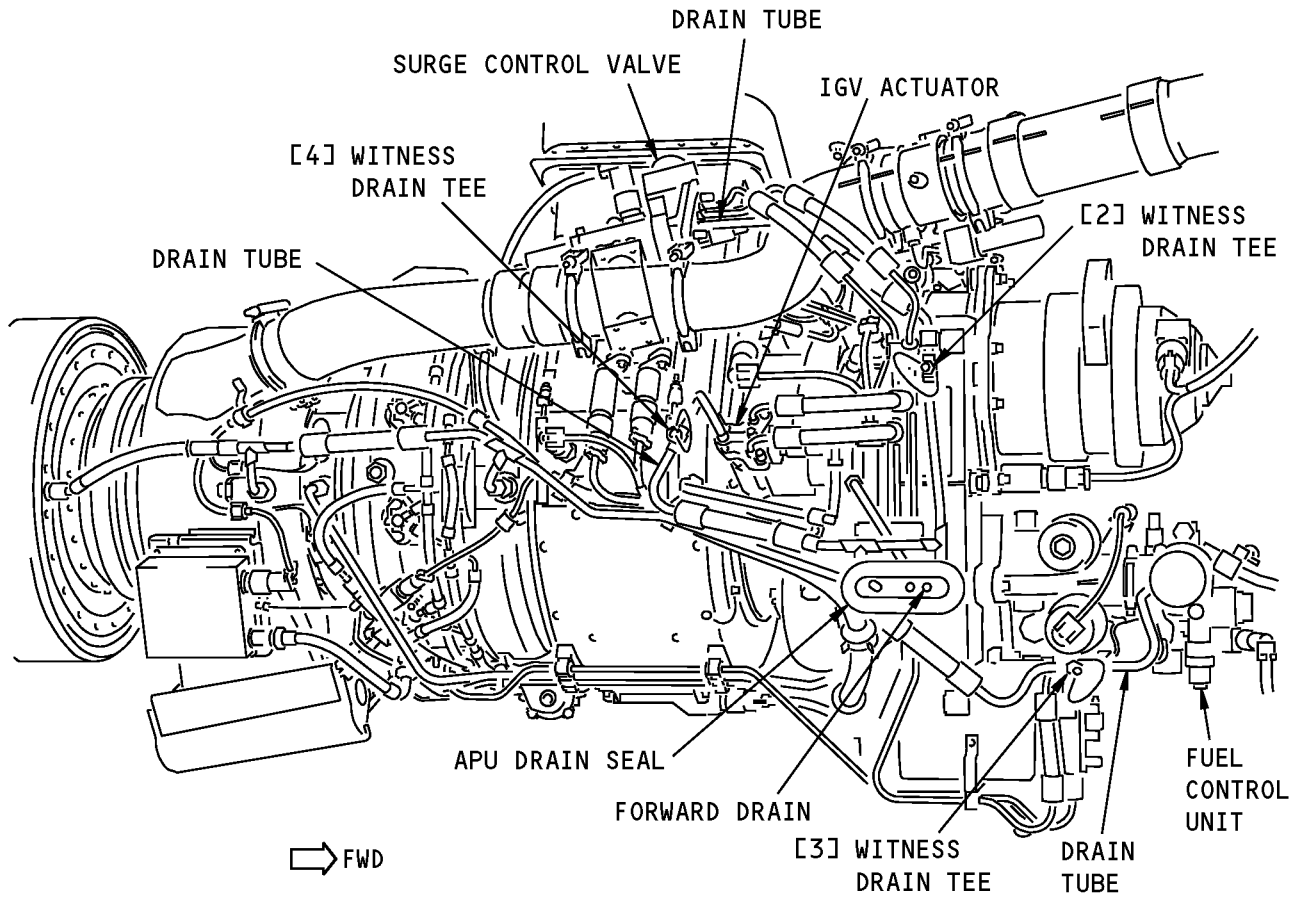
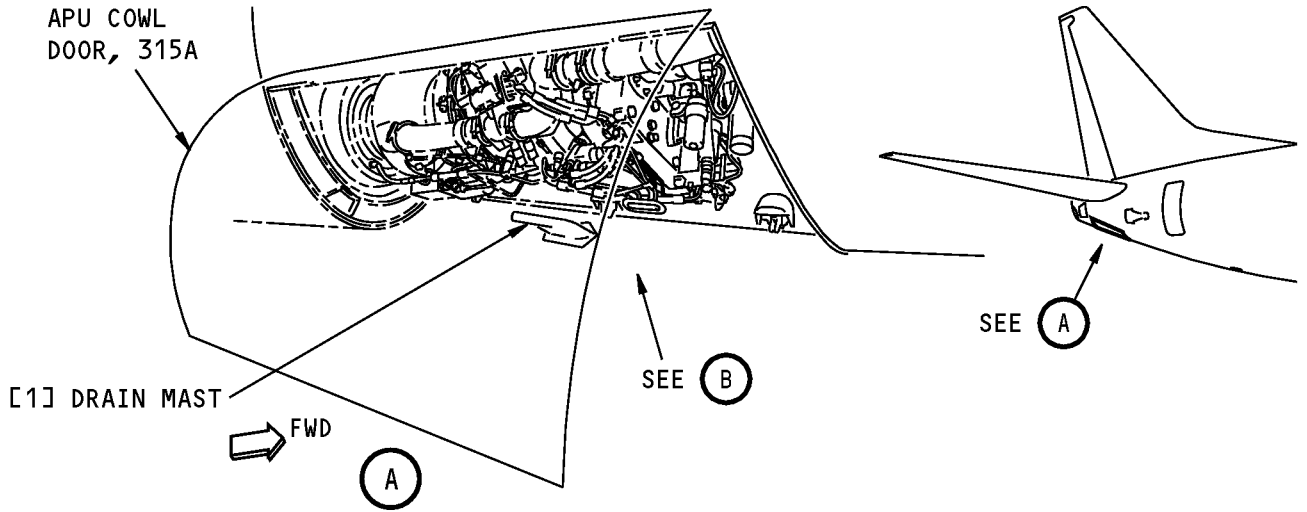
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(VIEW IN THE UP DIRECTION)

B

**Drain Mast Servicing**  
**Figure 301/49-16-11-990-803**

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# AIRCRAFT MAINTENANCE MANUAL

## DRAIN MAST - INSPECTION/CHECK

### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has the task to do an inspection of the drain mast on the APU cowl door.

### **TASK 49-16-11-200-801**

### 2. Drain Mast Inspection Procedure

(Figure 601)

#### A. General

- (1) This procedure is a scheduled maintenance task.

#### B. References

Reference	Title
49-11-00-710-802	APU Operation Limits (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-16-11-680-801	Drain Mast Servicing (P/B 301)

#### C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### D. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### E. Procedure

SUBTASK 49-16-11-210-003

- (1) Do these steps to inspect the drain mast [1] on the APU cowl door:
  - (a) Visually examine the drain mast [1] for fuel, oil and other fluid leakage.
 

**NOTE:** Fuel, oil and other fluids from the APU and the APU compartment will come out of the drain mast hole.

- (b) If there is fuel, oil or other fluid leakage, then do these steps:

- 1) Open this APU cowl door. To open this APU cowl door, do these steps:

Number	Name/Location
315A	APU Cowl Door

- a) Open the three latches.
- b) Open the APU cowl door.
- c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU cowl door.
- d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- e) Disconnect the two hold-open rods from the two spring clips.

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- f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- g) Install the two retainer pins in the two rod ends.
- 2) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- 3) Operate the APU for a minimum of five minutes.
- 4) During the APU operation, examine the forward drain [5], middle drain [4] and aft drain [3] of the APU drain seal [2] on the APU for fuel, oil or other fluid leakage.

**NOTE:** Fuel leakage from the fuel control unit, inlet guide vane actuator or surge control valve will drain from the forward drain [5]. Oil leakage from the load compressor seal will drain from the middle drain [4]. Fuel, oil or water leakage from the exhaust duct muffler, eductor housing or combustor will drain from the aft drain [3].

**NOTE:** A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted during an APU operation from the forward drain [5].

**NOTE:** There is no oil leakage limit from the middle drain [4]. If you find oil leakage, clean the drain and operate the APU for a minimum of 5 minutes, if the leakage continues, you must repair the oil leakage and make sure that the APU oil consumption limit is satisfactory. See figure 201 (APU Operation Limits, TASK 49-11-00-710-802).

- 5) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
- 6) If there is more than the fuel leakage rate, do this task: Drain Mast Servicing, TASK 49-16-11-680-801.
- 7) If there is less than the fuel leakage rate, the APU is satisfactory.
- 8) Close this APU cowl door. To close this APU cowl door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
  - b) Disconnect the two hold-open rods from the two brackets.
  - c) Put the two hold-open rods in the two spring clips on the APU cowl door.
  - d) Install the retainer pin in the rod end of the forward hold-open rod.
  - e) Install the retainer pin to the spring clip on the aft hold-open rod.
  - f) Close the APU cowl door.
  - g) Close the three latches.
- (c) If there is no fuel, oil or other fluid leakage, the APU is satisfactory.

————— **END OF TASK** —————

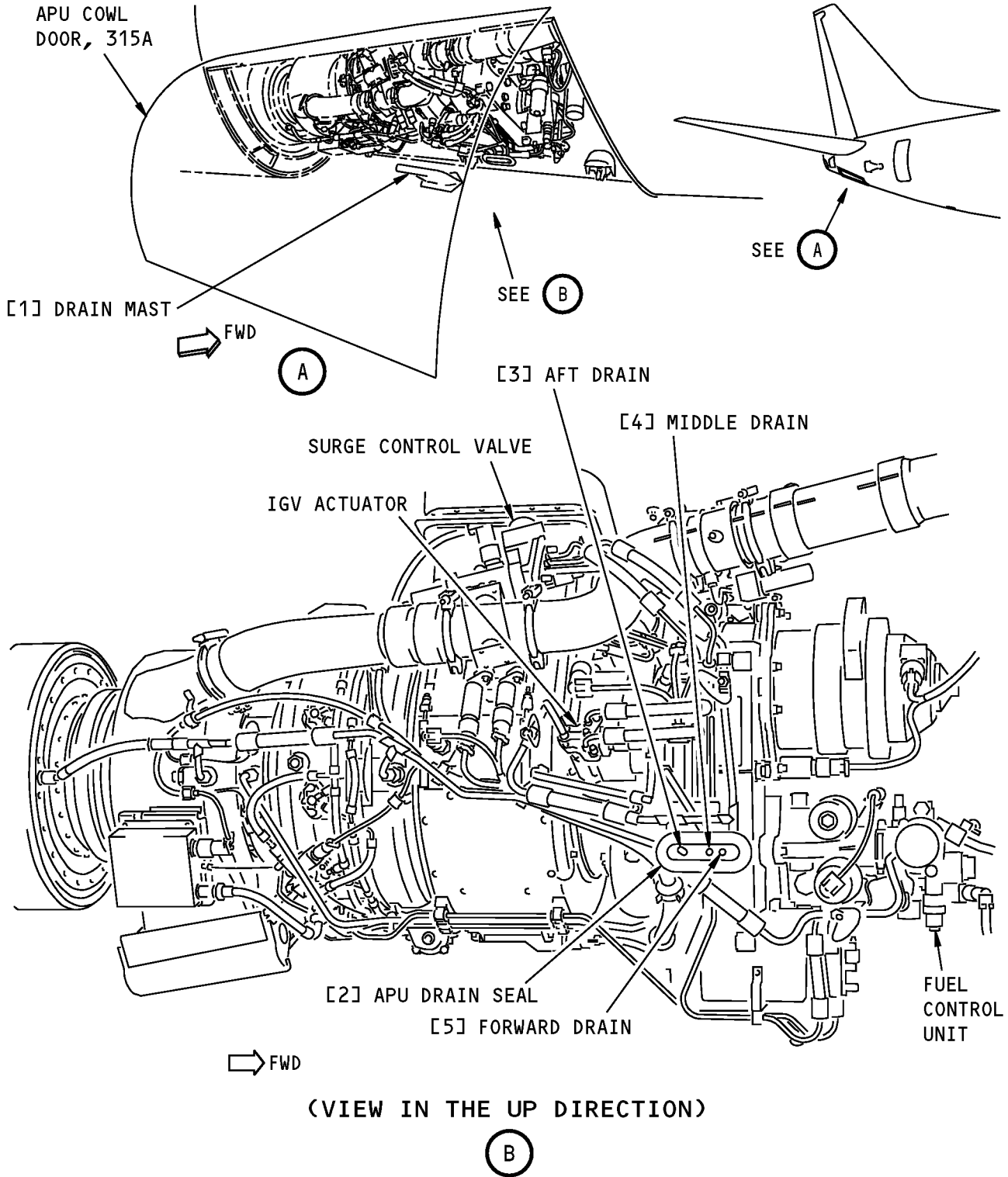
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**Drain Mast Inspection  
Figure 601/49-16-11-990-804**

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## APU DRAINS - CLEANING/PAINTING

### 1. General

- A. This procedure gives the task to clean the APU drains.
- B. The drain tubes and APU drain seal are installed on the bottom of the APU. The drain mast is installed on the APU cowl door.

### **TASK 49-16-11-100-801**

### 2. Clean the APU Drains

(Figure 701)

#### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-16-12-000-801	Combustor Drain Removal (P/B 401)
49-16-12-400-801	Combustor Drain Installation (P/B 401)
49-17-11-000-801	Insulation Panel Removal (P/B 401)
49-17-11-400-801	Insulation Panel Installation (P/B 401)

#### B. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1249	Bit - Drill, Size 54 (0.0550 Inch Diameter)
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

#### C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

#### D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
22	Packing	49-52-12-01-025	HAP 001-013, 015-026, 028-030
		49-52-12-01-030	HAP 001-013, 015-026, 028-030
		49-52-12-01-035	HAP 001-013, 015-026, 028-030
		49-52-12-02-025	HAP 031-054, 101-999
		49-52-12-02-030	HAP 031-054, 101-999
		49-52-12-02-035	HAP 031-054, 101-999
25	Packing	49-31-11-01-030	HAP 001-013, 015-026, 028-030

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
25 (cont.)		49-31-11-02-025	HAP 031-054, 101-999
28	Packing	49-52-12-01-025	HAP 001-013, 015-026, 028-030
		49-52-12-01-030	HAP 001-013, 015-026, 028-030
		49-52-12-01-035	HAP 001-013, 015-026, 028-030
		49-52-12-02-025	HAP 031-054, 101-999
		49-52-12-02-030	HAP 031-054, 101-999
		49-52-12-02-035	HAP 031-054, 101-999

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Prepare for the Cleaning

SUBTASK 49-16-11-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-16-11-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-16-11-010-001

- (3) Open this APU cowl door. To open this APU cowl door, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU cowl door.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU cowl door.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.

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- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### H. Procedure

SUBTASK 49-16-11-210-001

- (1) Do these steps to inspect the APU drains:
  - (a) Examine the drain tubes, APU drain seal and drain mast for cracks, worn areas and corrosion.
  - (b) Examine the drain tube fittings for damaged threads and cracks.

SUBTASK 49-16-11-160-001

- (2) Do these steps to clean the APU drain tubes:
  - (a) Clean the drain tube [11] for the exhaust duct muffler, drain tube [14] for the eductor housing, drain tube [15] for the combustor drain and duct drain tube [19] for the compressor inlet plenum:
    - 1) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the exhaust duct muffler.
    - 2) Disconnect the drain tube [11] from the fitting [12] on the exhaust duct muffler.
    - 3) Drain the water and fuel from the drain tube [11] and exhaust duct muffler into the 1 gallon (4 l) fuel resistant container, STD-4049.
    - 4) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the eductor housing.
    - 5) Disconnect the drain tube [14] from the fitting [13] on the eductor housing.
    - 6) Drain the water and oil from the drain tube [14] and eductor housing into the 1 gallon (4 l) fuel resistant container, STD-4049.
    - 7) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the diffuser housing.

**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- 8) Disconnect the drain tube [15] from the combustor drain.
- 9) Drain the fuel from the drain tube [15] and combustor drain into the 1 gallon (4 l) fuel resistant container, STD-4049.
- 10) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the compressor inlet plenum.
- 11) Disconnect the duct drain tube [19] from the fitting [16] on the compressor inlet plenum.
- 12) Drain the water and other fluids from the duct drain tube [19] and compressor inlet plenum into the 1 gallon (4 l) fuel resistant container, STD-4049.
- 13) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to blow the air through the four drain tubes [11], [14], [15], [19].

**NOTE:** It is recommended that you use a pressure of 60 psig (413.7 kPa)-90 psig (620.5 kPa) of air or nitrogen to blow the air through the four drain tubes.

- 14) Make sure the air flows through the three drain tubes [11], [14], [15] to the aft drain [8] on the APU drain seal [9].
- 15) Make sure the air flows through the duct drain tube [19] to the APU compartment.

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- 16) Do this task: Combustor Drain Removal, TASK 49-16-12-000-801.
  - 17) Use a drill bit, STD-1249, to clear the combustor drain hole for blockage.  
NOTE: The inner diameter of the combustor drain hole is 0.060 in. (1.5 mm).
  - 18) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to blow the air through the four drain holes of the exhaust duct muffler, eductor housing, diffuser housing boss and compressor inlet plenum.  
NOTE: You will hear a different noise from the diffuser housing boss when you blow air through the drain hole. The noise you hear is satisfactory.
  - 19) Do this task: Combustor Drain Installation, TASK 49-16-12-400-801.  
NOTE: The drain tube [15] is connected to the combustor drain during the combustor drain installation.
  - 20) Apply a thin layer of Never-Seez NSBT-8N compound, D00006, on the threads of the fitting [16].
  - 21) Connect the duct drain tube [19] to the fitting [16] on the compressor inlet plenum.
    - a) Tighten the duct drain tube [19] to 230 in-lb (26.0 N·m).
  - 22) Apply a thin layer of Never-Seez NSBT-8N compound, D00006, on the threads of the fitting [13].
  - 23) Connect the drain tube [14] to the fitting [13] on the eductor housing.
  - 24) Apply a thin layer of Never-Seez NSBT-8N compound, D00006, on the threads of the fitting [12].
  - 25) Connect the drain tube [11] to the fitting [12] on the exhaust duct muffler.
  - 26) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.
- (b) Clean the drain tube [10] for the APU engine:
- 1) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the APU engine.
  - 2) Disconnect the drain tube [10] from the APU engine.
  - 3) Drain the oil from the drain tube [10] and APU engine into the 1 gallon (4 l) fuel resistant container, STD-4049.
  - 4) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to blow the air through the drain tube [10].
  - 5) Make sure the air flows through the drain tube [10] to the middle drain [7] on the APU drain seal [9].
  - 6) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to blow the air through the drain hole of the APU engine.
  - 7) If you find blockage in the drain tube [10] or the drain hole of the APU engine, do a visual inspection of the compressor inlet plenum:
    - a) Loosen the eight captive screws [24] that attach the access door [23] to the compressor inlet plenum.
    - b) Remove the access door [23] from the compressor inlet plenum.  
NOTE: A lanyard is attached to the access door to keep the access door with the APU.
    - c) Visually examine the compressor inlet plenum for blockage of unwanted materials.
    - d) If you find blockage of unwanted materials, remove all the unwanted materials from the area.

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- e) Install the access door [23] to the compressor inlet plenum with the eight captive screws [24].
- 8) Connect the drain tube [10] to the APU engine.
- 9) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.
- (c) Clean the drain tube [2] for the surge control valve, drain tube [4] for the fuel control unit and drain tube [18] for the inlet guide vane (IGV) actuator:
  - 1) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the surge control valve.
  - 2) Loosen the two bolts [21] that attach the bracket [20] to the surge control valve.
  - 3) Disconnect the drain tube [2] from the surge control valve.
  - 4) Remove the two packings [22] from the drain tube [2].
    - a) Discard the two packings [22].
  - 5) Drain the fuel from the drain tube [2] and surge control valve into the 1 gallon (4 l) fuel resistant container, STD-4049.
  - 6) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the IGV actuator.
  - 7) Loosen the three bolts [29] that attach the bracket [30] to the IGV actuator.
  - 8) Disconnect the drain tube [18] from the IGV actuator.
  - 9) Remove the two packings [28] from the drain tube [18].
    - a) Discard the two packings [28].
  - 10) Drain the fuel from the drain tube [18] and IGV actuator into the 1 gallon (4 l) fuel resistant container, STD-4049.
  - 11) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the fuel control unit.
  - 12) Loosen the three bolts [26] that attach the bracket [27] to the fuel control unit.
  - 13) Disconnect the drain tube [4] from the fuel control unit.
  - 14) Remove the two packings [25] from the drain tube [4].
    - a) Discard the two packings [25].
  - 15) Drain the fuel from the drain tube [4] and fuel control unit into the 1 gallon (4 l) fuel resistant container, STD-4049.

**CAUTION:** DO NOT BLOW THE AIR THROUGH THE SUPPLY, RETURN AND DRAIN HOLES OF THE SURGE CONTROL VALVE, IGV ACTUATOR AND FUEL CONTROL UNIT. DAMAGE TO THE EQUIPMENT CAN OCCUR.

- 16) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to blow the air through the three drain tubes [2], [18], [4].
- 17) Make sure the air flows through the three drain tubes [2], [18], [4] to the forward drain [6] on the APU drain seal [9].

**NOTE:** Three witness drain tees [3], [17], [5] are installed between the three drain tubes and the forward drain. You must remove the caps of the witness drain tees to clean the drain tubes.

- 18) Lubricate the two new packings [22] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
- 19) Install the two packings [22] on the drain tube [2].
- 20) Connect the drain tube [2] with the bracket [20] to the surge control valve.

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- 21) Tighten the two bolts [21] that attach the bracket [20] to the surge control valve to 50 in-lb (5.6 N·m).
- 22) Lubricate the two new packings [28] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
- 23) Install the two packings [28] on the drain tube [18].
- 24) Connect the drain tube [18] with the bracket [30] to the IGV actuator.
- 25) Tighten the three bolts [29] that attach the bracket [30] to the IGV actuator to 50 in-lb (5.6 N·m).
- 26) Lubricate the two new packings [25] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
- 27) Install the two packings [25] on the drain tube [4].
- 28) Connect the drain tube [4] with the bracket [27] to the fuel control unit.
- 29) Tighten the three bolts [26] that attach the bracket [27] to the fuel control unit to 50 in-lb (5.6 N·m).
- 30) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

SUBTASK 49-16-11-110-001

(3) Do these steps to clean the APU drain seal [9]:

- (a) Clean the APU drain seal [9] with alcohol, B00130, and a cotton wiper, G00034.
- (b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the APU drain seal [9].

**NOTE:** It is recommended that you use a pressure of 60 psig (413.7 kPa)-90 psig (620.5 kPa) of air or nitrogen to dry the surfaces of the APU drain seal and drain mast.

SUBTASK 49-16-11-110-002

(4) Do these steps to clean the drain mast [1] and drain cup [31] on the APU cowl door:

- (a) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to blow the air through the drain hole on the drain mast [1] or the drain hole in the drain cup [31].
- (b) Make sure the air flows through the drain tube [33] to the drain mast [1] or drain cup [31].
- (c) If the air does not flow through the drain tube [33] or the drain mast [1], do these steps to clean the drain tube or drain mast [1]:

**NOTE:** It is not necessary to remove the insulation panel from the APU cowl door or to disconnect the two clamps from the drain tube if you can gain access to the unwanted materials or the blockage in the drain tube.

- 1) To remove the insulation panel from the APU cowl door, do this task: Insulation Panel Removal, TASK 49-17-11-000-801.
- 2) Disconnect the two clamps [32] and remove the drain tube from the drain cup [31].
- 3) Remove the unwanted materials or blockage from the drain tube [33].
- 4) Use a plastic or nylon-coated wire, flexible non-metal brush or equivalent tool to clear the inner tube of the drain mast [1].
- 5) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to clear the drain tube [33] and drain mast [1].
- 6) If the two clamps [32] were disconnected during the drain tube removal, install the drain tube [33] to the drain cup [31] and connect the two clamps.

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- 7) If the insulation panel was removed from the APU cowl door, re-install the insulation panel. To re-install it, do this task: Insulation Panel Installation, TASK 49-17-11-400-801.
- (d) Clean the drain cup [31] with alcohol, B00130, and a cotton wiper, G00034.
- (e) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the drain cup [31].

SUBTASK 49-16-11-210-002

- (5) To make sure the APU drain seal [9] aligns with the drain cup [31] on the APU cowl door, do these steps:
  - (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
  - (b) Disconnect the two hold-open rods from the two brackets.
  - (c) Put the two hold-open rods in the two spring clips on the APU cowl door.
  - (d) Make sure the APU drain seal [9] correctly engages the drain cup [31] while you close the APU cowl door.
  - (e) Open the APU cowl door.
  - (f) Disconnect the two hold-open rods from the two spring clips.
  - (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
  - (h) Install the two retainer pins in the two rod ends.

#### I. APU Drains Installation Test

SUBTASK 49-16-11-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-16-11-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-16-11-790-001

- (3) Do the installation test for the APU drains:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Operate the APU for a minimum of five minutes.
  - (c) During the APU operation, examine the fuel supply, return and drain tube connections for the surge control valve, IGV actuator and fuel control unit for signs of fuel leakage.
 

NOTE: A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted during an APU operation from the forward drain [6] on the APU drain seal [9].
  - (d) Examine the APU drain tubes, drain tube fittings and APU drain seal for signs of fuel leakage.

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- (e) If you find fuel leakage in the tube connections, tubes and APU drain seal or more than the fuel leakage rate from the forward drain, do these steps to repair the leakage:
  - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
  - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
  - 3) Repair the cause of the fuel leakage.
  - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
  - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - 6) During the APU operation, examine the fuel leakage area(s) that you found before for signs of leakage.
  - 7) If you find fuel leakage or more than the fuel leakage rate, do the leakage repair again.
- (f) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

### J. Put the Airplane Back to Its Usual Condition

SUBTASK 49-16-11-410-001

- (1) Close this APU cowl door. To close this APU cowl door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU cowl door.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU cowl door.
- (g) Close the three latches.

————— **END OF TASK** —————

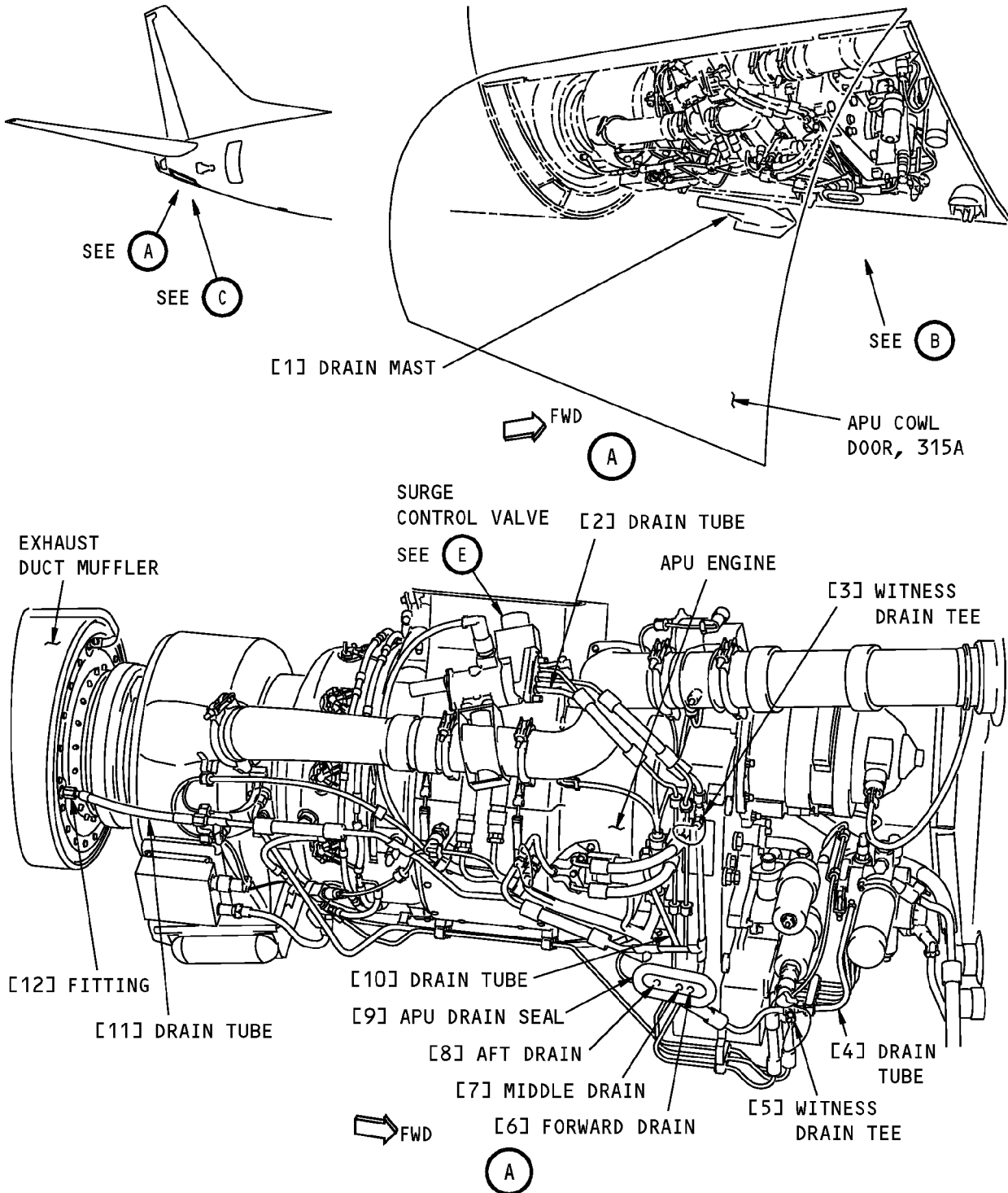
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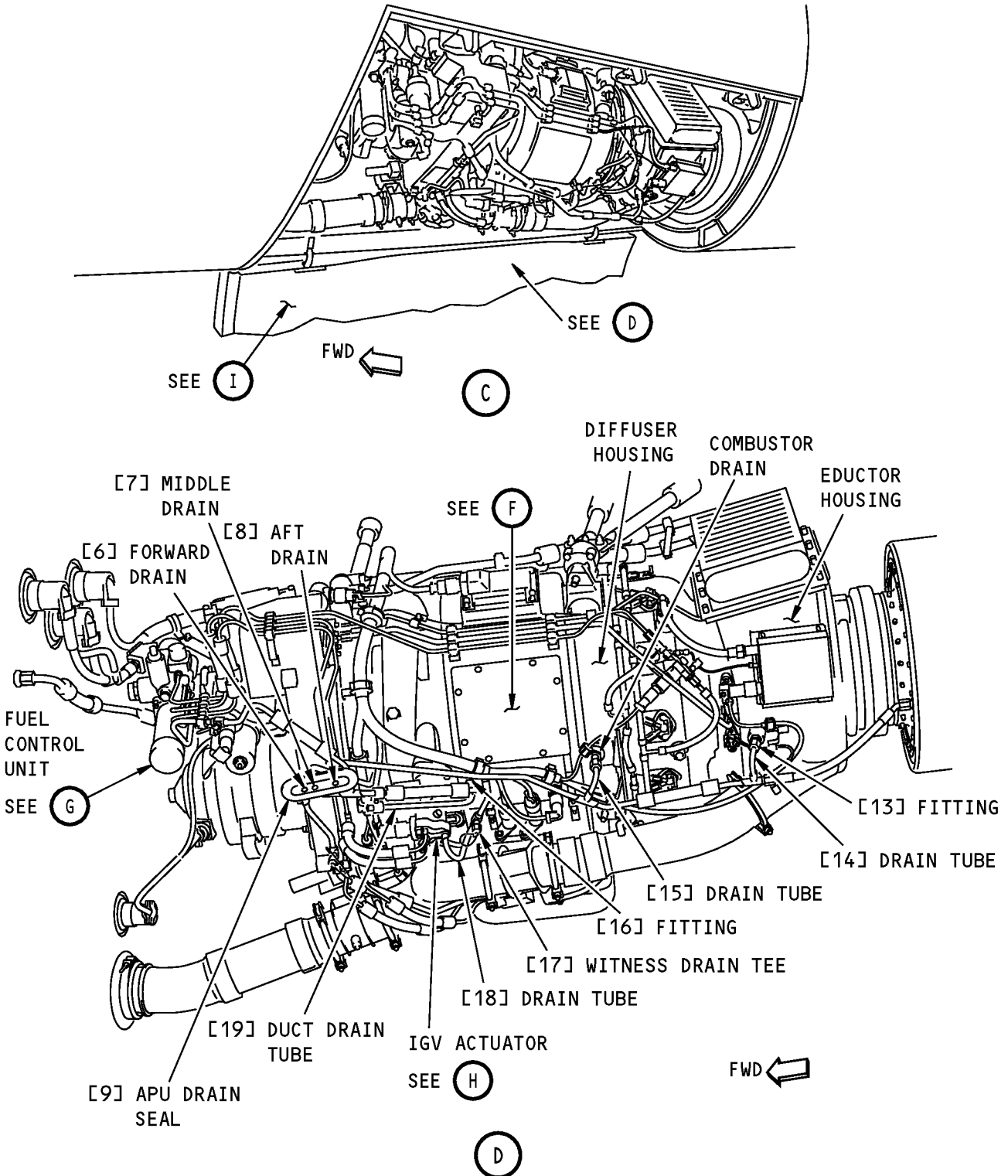
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**APU Drains Cleaning  
Figure 701 (Sheet 1 of 4)/49-16-11-990-801**

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**APU Drains Cleaning**  
**Figure 701 (Sheet 2 of 4)/49-16-11-990-801**

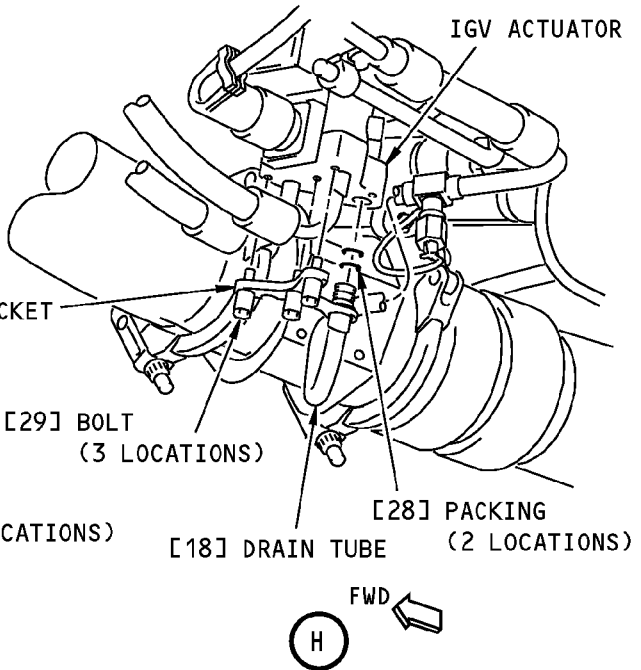
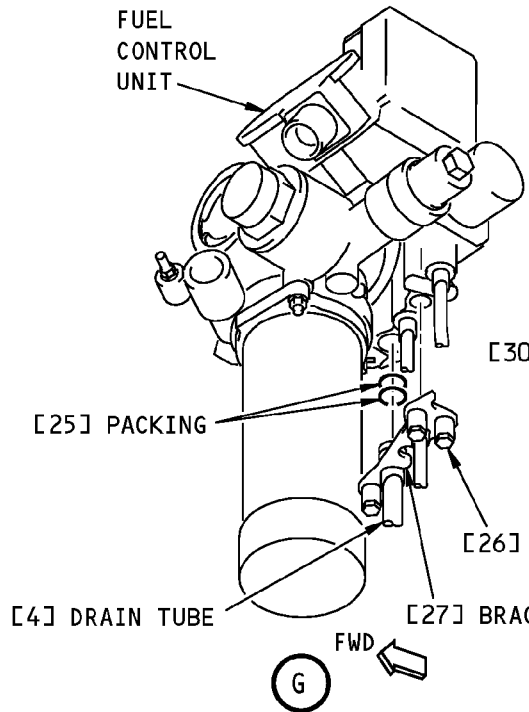
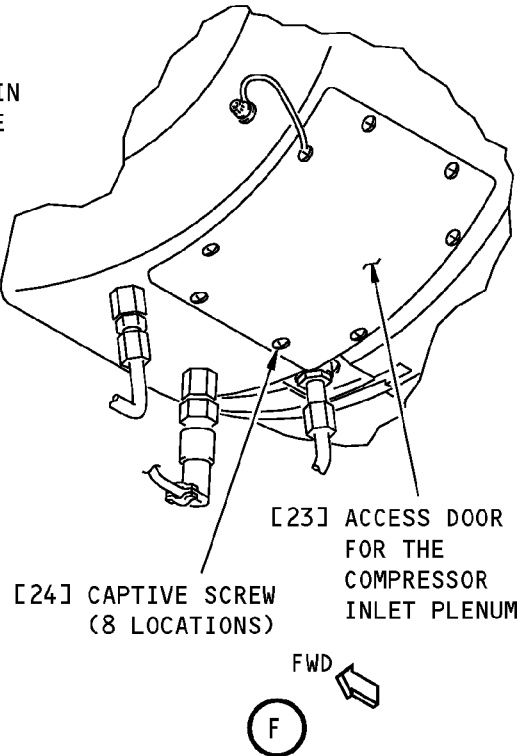
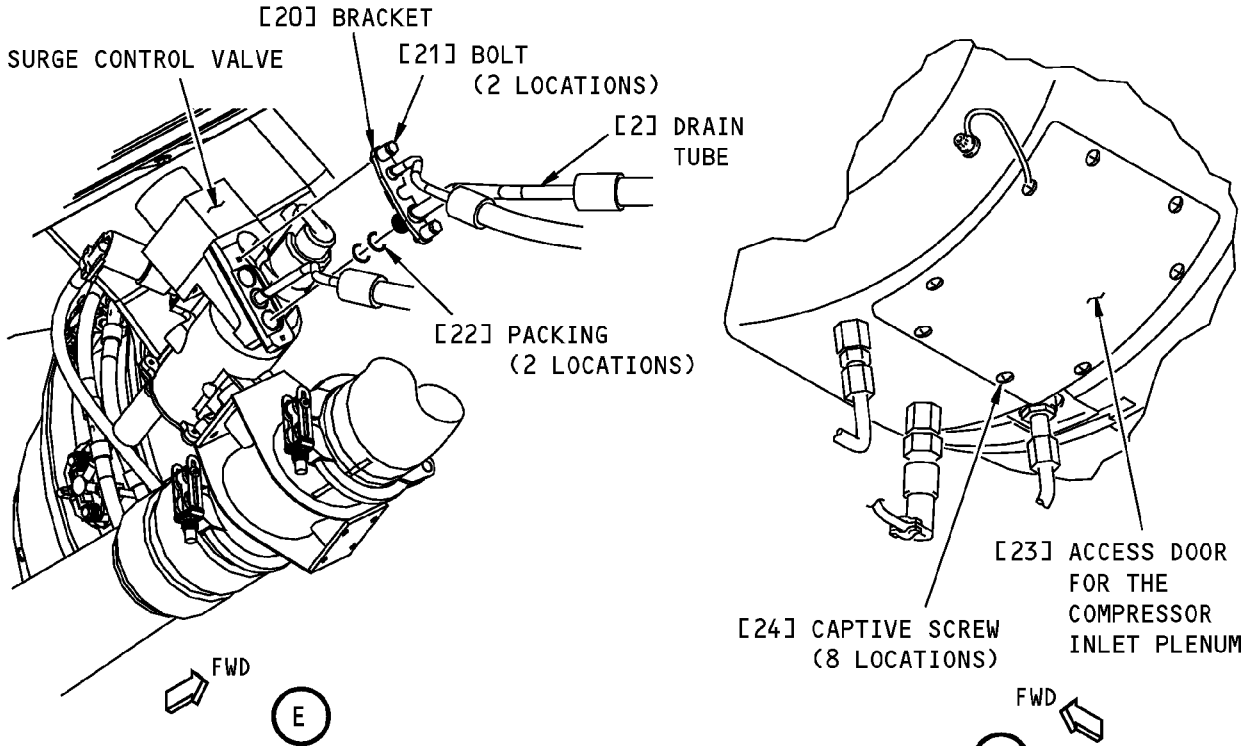
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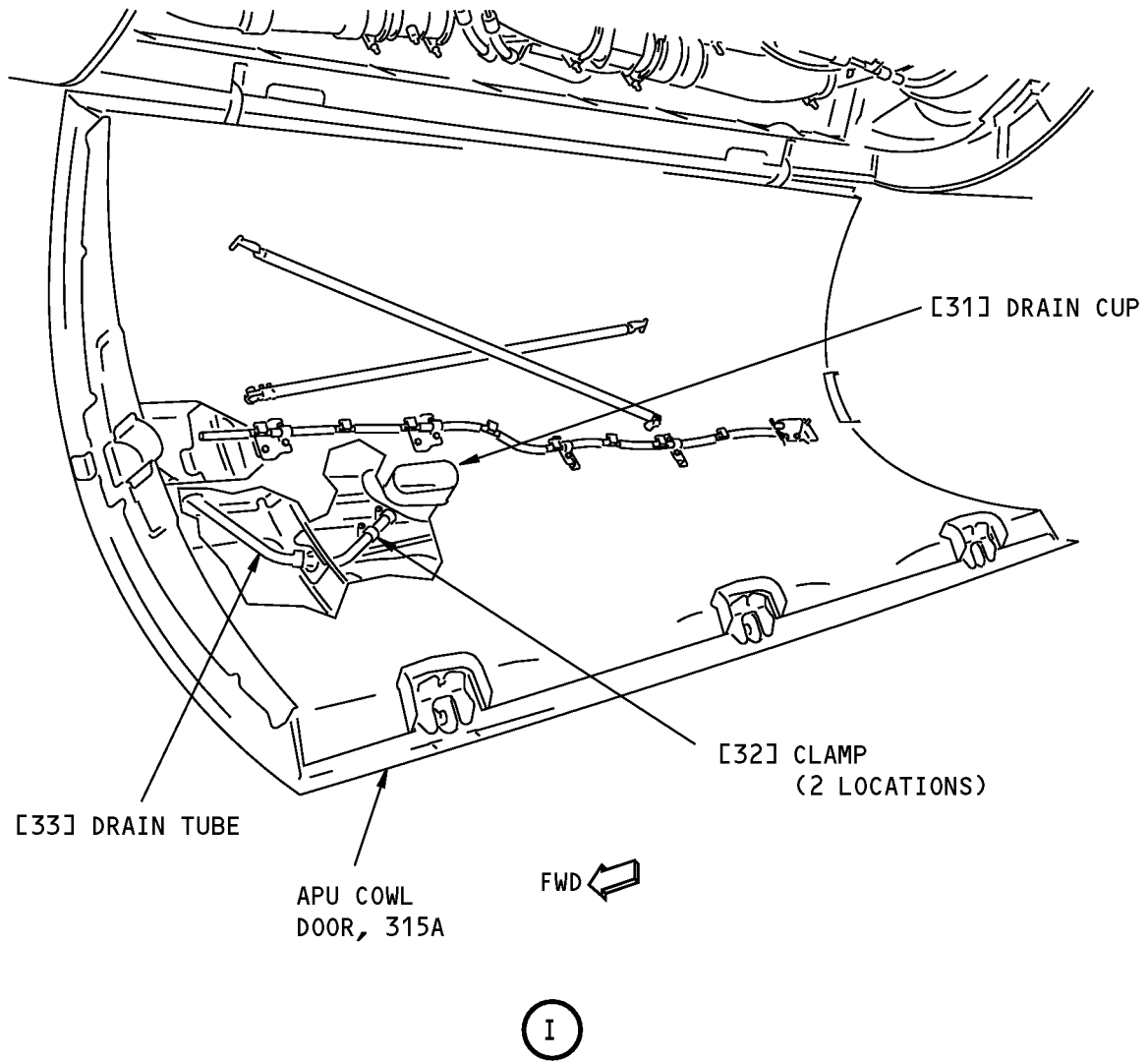


**APU Drains Cleaning**  
Figure 701 (Sheet 3 of 4)/49-16-11-990-801

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**APU Drains Cleaning**  
**Figure 701 (Sheet 4 of 4)/49-16-11-990-801**

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## AIRCRAFT MAINTENANCE MANUAL

### COMBUSTOR DRAIN - REMOVAL/INSTALLATION

#### 1. General

A. This procedure has these tasks:

- (1) A removal of the combustor drain
- (2) An installation of the combustor drain.

B. The combustor drain is also referred to as the orificed tube adapter.

C. The combustor drain is installed on the bottom of the diffuser housing.

#### **TASK 49-16-12-000-801**

#### 2. Combustor Drain Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-16-12-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-16-12-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-16-12-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.

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- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### E. Combustor Drain Removal

SUBTASK 49-16-12-020-001

- (1) Do these steps to remove the combustor drain [3]:
  - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049 below the diffuser housing.

**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Disconnect the drain tube [2] from the combustor drain [3].
- (c) Drain the fuel from the drain tube [2] and combustor drain [3] into the 1 gallon (4 l) fuel resistant container, STD-4049.

**NOTE:** Fuel is usually not found in the combustor drain [3]. Fuel in the combustor drain shows that there is a problem with the fuel system.

- (d) Remove the combustor drain [3] from the diffuser housing boss [1].
- (e) Remove the gasket [4] from the combustor drain [3].
  - 1) Discard the gasket [4].
- (f) Install the caps on the drain tube [2] and diffuser housing boss [1].
- (g) Make sure you install all necessary protection covers.
- (h) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

————— **END OF TASK** —————

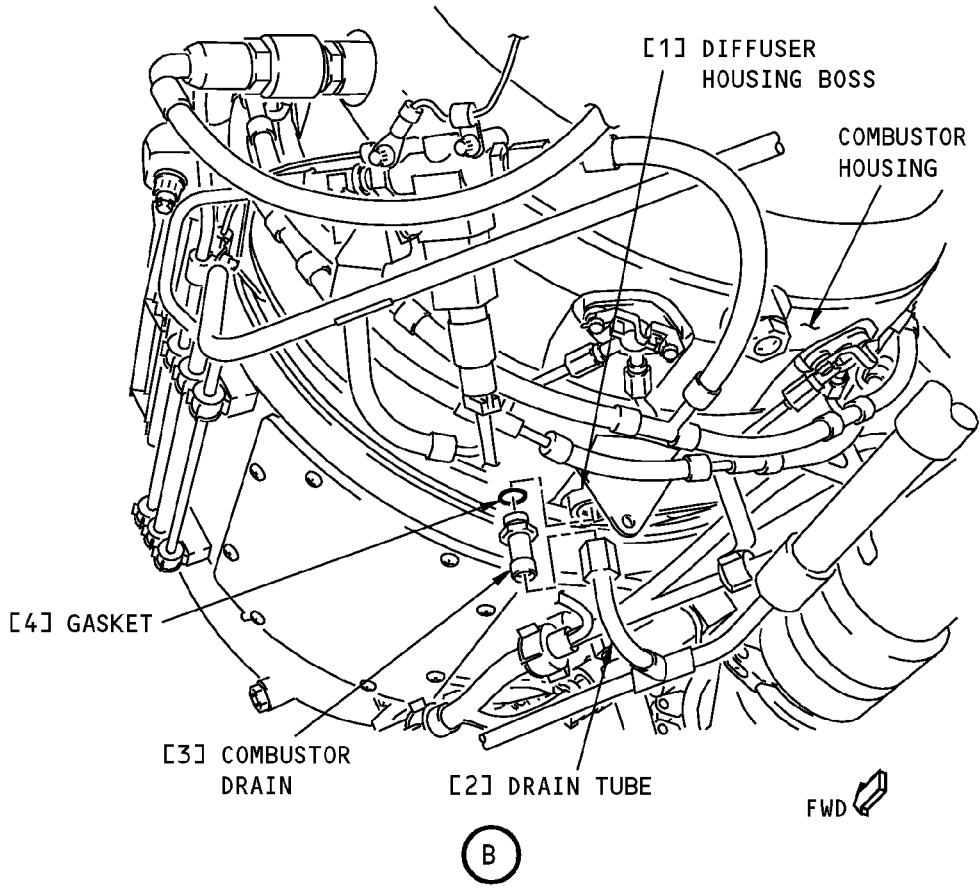
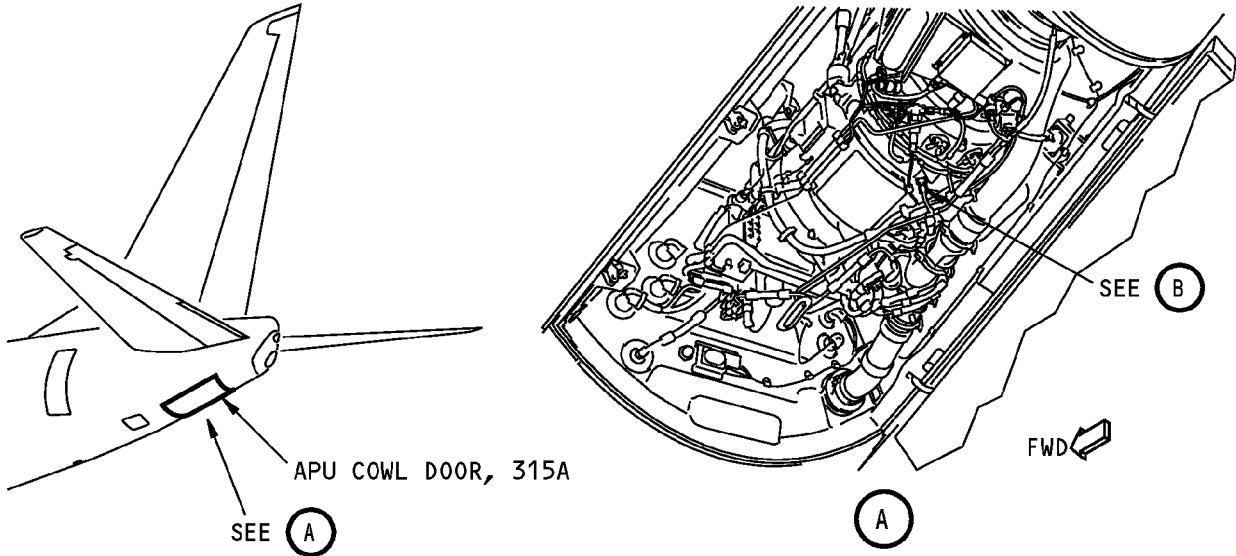
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**Combustor Drain Installation  
Figure 401/49-16-12-990-801**

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TASK 49-16-12-400-801

#### 3. Combustor Drain Installation

(Figure 401)

##### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

##### B. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

##### C. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F

##### D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Combustor drain	49-11-01-01-020	HAP 001-013, 015-026, 028-030
4	Gasket	49-11-01-02-020	HAP 031-054, 101-999
		49-11-01-01-025	HAP 001-013, 015-026, 028-030
		49-11-01-02-025	HAP 031-054, 101-999

##### E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

##### F. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### G. Procedure

SUBTASK 49-16-12-160-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to clean the combustor drain [3]:
  - (a) Remove the caps from the drain tube [2] and diffuser housing boss [1].

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- (b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to blow the air through the drain tube [2] and the drain hole of the diffuser housing boss [1].

NOTE: It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to blow the air through the drain tube and drain hole.

NOTE: You will hear a different noise from the diffuser housing boss when you blow air through the drain hole. The noise you hear is satisfactory.

- (c) Make sure the air flows through the drain tube [2] to the aft drain on the APU drain seal.

SUBTASK 49-16-12-420-001

- (2) Do these steps to install the combustor drain [3]:

- (a) Apply a thin layer of Never-Seez NSBT-8N compound, D00006 on the threads of the combustor drain [3].

NOTE: There are two threaded ends on the combustor drain [3]. You apply the Never-Seez NSBT-8N compound, D00006 on the two threaded ends.

- (b) Install the gasket [4] on the combustor drain [3].
- (c) Install the combustor drain [3] in the diffuser housing boss [1].
  - 1) Tighten the combustor drain [3] to 125 in-lb (14.1 N-m).
- (d) Connect the drain tube [2] to the combustor drain [3].

H. Combustor Drain Installation Test

SUBTASK 49-16-12-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-16-12-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-16-12-790-001

- (3) Do the installation test for the combustor drain [3]:

- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (b) Operate the APU for a minimum of five minutes.
- (c) During the APU operation, examine the combustor drain [3] for signs of air leakage.
- (d) If you find air leakage, do these steps to repair the leakage:
  - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
  - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
  - 3) Repair the cause of the air leakage.
  - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

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- 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - 6) During the APU operation, examine the combustor drain [3] for signs of air leakage.
  - 7) If you find air leakage, do the leakage repair again.
- (e) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

### I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-16-12-410-001

- (1) Close this APU cowl door. To close this APU cowl door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU cowl door.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU cowl door.
- (g) Close the three latches.

————— **END OF TASK** —————

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# AIRCRAFT MAINTENANCE MANUAL

## COMBUSTOR DRAIN - CLEANING/PAINTING

### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has the task to clean the combustor drain. The combustor drain is installed on the bottom of the diffuser housing.

#### **TASK 49-16-12-100-801**

### 2. Combustor Drain Cleaning

#### A. General

- (1) This procedure is a scheduled maintenance task.

#### B. References

Reference	Title
49-16-12-000-801	Combustor Drain Removal (P/B 401)
49-16-12-400-801	Combustor Drain Installation (P/B 401)

#### C. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1249	Bit - Drill, Size 54 (0.0550 Inch Diameter)

#### D. Location Zones

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right

#### E. Procedure

SUBTASK 49-16-12-160-002

- (1) Do these steps to clean the combustor drain:

**NOTE:** There is no operational checkout for the combustor drain. You must clean the combustor drain to make sure there is no blockage of unwanted materials in the diffuser housing.

- (a) Do this task: Combustor Drain Removal, TASK 49-16-12-000-801.
- (b) Examine the combustor drain and the drain tube for damaged threads and cracks.
- (c) Use a drill bit, STD-1249 or equivalent tool to clear the combustor drain hole for blockage.

**NOTE:** The inner diameter of the combustor drain hole is 0.060 inch (1.5 mm).

- (d) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to blow the air through the drain hole of the diffuser housing boss.

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to blow the air through the drain hole of the diffuser housing boss.

**NOTE:** You will hear a different noise from the diffuser housing boss when you blow air through the drain hole. The noise you hear is satisfactory.

- (e) Do this task: Combustor Drain Installation, TASK 49-16-12-400-801.

————— **END OF TASK** —————

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## AIRCRAFT MAINTENANCE MANUAL

### INSULATION PANEL - REMOVAL/INSTALLATION

#### 1. General

- A. This procedure has these tasks:
  - (1) A removal of the insulation panel
  - (2) An installation of the insulation panel.
- B. There are seven insulation panels installed on the APU cowl door and on the APU compartment walls.
- C. You can replace the insulation panel on the APU cowl door with the APU cowl door removed or installed on the airplane.
- D. You must remove the APU to replace the other six insulation panels on the APU compartment walls.

#### **TASK 49-17-11-000-801**

#### 2. Insulation Panel Removal

(Figure 401)

##### A. References

Reference	Title
49-11-00-000-801	APU Power Plant Removal (P/B 401)
49-13-11-000-802	APU Mounts Removal (P/B 401)
52-48-21-000-801	Auxiliary Power Unit (APU) Cowl Door Removal (P/B 401)

##### B. Consumable Materials

Reference	Description	Specification
G00472	Twine - Impregnated Fibrous, Lacing And Tying	MIL-T-713

##### C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

##### D. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### E. Prepare for the Removal

SUBTASK 49-17-11-020-001

- (1) Remove the APU. To remove it, do this task: APU Power Plant Removal, TASK 49-11-00-000-801.

NOTE: It is not necessary to remove the APU for the removal of the insulation panel [13] from the APU Cowl Door, 315A..

SUBTASK 49-17-11-860-005

- (2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
A	23	C00403	FIRE PROTECTION DETECTION APU

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SUBTASK 49-17-11-010-003

(3) If you must remove the insulation panel [13] from the APU Cowl Door, 315A, do these steps to get access to the insulation panel:

- (a) Make sure the APU master switch on the P5 forward overhead panel is OFF and attach a DO-NOT-OPERATE tag.
- (b) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

(c) If it is necessary, remove the access panel:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- 1) Do this task: Auxiliary Power Unit (APU) Cowl Door Removal, TASK 52-48-21-000-801.
- 2) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- 3) Remove the retainer pin from the spring clip on the aft hold-open rod.
- 4) Disconnect the two hold-open rods from the two spring clips.

(d) If it is not necessary to remove, open the access panel by do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- 1) Open the three latches.
- 2) Open the APU Cowl Door, 315A.
- 3) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- 4) Remove the retainer pin from the spring clip on the aft hold-open rod.
- 5) Disconnect the two hold-open rods from the two spring clips.

#### F. Insulation Panel Removal

SUBTASK 49-17-11-020-002

- (1) Do these steps to remove the insulation panel [13] from the APU Cowl Door, 315A:
  - (a) Remove the cotter pins [22], two nuts [23], four washers [24] and two bolts [25] from the two hold-open rods [3].
  - (b) Remove the two hold-open rods [3].
  - (c) Remove the two screws [19] and two washers [20] from the two spring clips [21].
  - (d) Remove the two spring clips [21].
  - (e) If the APU Cowl Door, 315A was not removed from the airplane, disconnect the electrical connector D40062 [10] from the APU fire detector [14].
  - (f) Remove the two screws [6] and four washers [7] from the two clamps [5].

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## AIRCRAFT MAINTENANCE MANUAL

- (g) Remove the two clamps [5] from the wire harness [4] for the APU fire detector.
- (h) Remove the six screws [11] and six washers [12] that attach the APU fire detector [14] to the APU Cowl Door, 315A.
- (i) Remove the two screws [15], two washers [16] and spacer [17] that attach the APU fire detector [14] to the APU Cowl Door, 315A.
- (j) Remove the two bolts [8] and two washers [9] that attach the APU fire detector [14] to the APU Cowl Door, 315A.
- (k) Remove the APU fire detector [14] from the APU Cowl Door, 315A.
- (l) Remove the 30 screws [1] and 30 washers [2] that attach the insulation panel [13] to the APU Cowl Door, 315A.

**CAUTION:** BE CAREFUL WHEN YOU REMOVE THE INSULATION PANEL. USE TWO PERSONS TO REMOVE THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (m) Remove the insulation panel [13].

SUBTASK 49-17-11-020-009

- (2) Do these steps to remove the left insulation panel [40]:

**NOTE:** You must remove the left insulation panel [40] before you can remove the other insulation panels from the APU compartment walls.

- (a) Remove the seven screws [33] and seven washers [34] that attach the firewall cover [35] to the left forward mount for the APU.
- (b) Remove the five screws [29] and five washers [30] that attach the forward firewall cover [31] to the left aft mount for the APU.
- (c) Remove the five screws [26] and five washers [27] that attach the aft firewall cover [28] to the left aft mount for the APU.
- (d) Move the aft firewall cover [28], forward firewall cover [31] and firewall cover [35] down on the APU mounts.
- (e) Remove the two alignment screws [36] and two washers [37].
- (f) Remove the screw [38] and washer [39].
- (g) Remove the two screws [41] and two washers [42] from the bottom forward corner of the left drip shield and forward drip shield.
- (h) Remove the 37 screws [41] and 37 washers [42] that attach the left insulation panel [40] to the APU compartment wall.

**CAUTION:** BE CAREFUL WHEN YOU REMOVE THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (i) Carefully remove the left insulation panel [40].

SUBTASK 49-17-11-020-003

- (3) Do these steps to remove the forward insulation panel [43]:

- (a) Do the procedure in this task to remove the left insulation panel [40].

**NOTE:** You must remove the left insulation panel [40] before you can remove the forward insulation panel [43].

- (b) Disconnect the electrical connector D40060 [50] from the APU firewall receptacle on the 1088 bulkhead.
- (c) Remove the three screws [54] and six washers [55] from the three clamps [53].

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- (d) Remove the three clamps [53] from the wire harness.
- (e) Remove the fanning strip [58] from the four wire harnesses [49].  
NOTE: The fanning strip show the identification of the terminal lugs (T1), (T2), (T3) and (T4) for the four wire harnesses.
- (f) Apply four identification tags to the four terminal lugs on the four wire harnesses for the correct installation to the four hole locations on the starter-generator firewall cover [44].
- (g) Remove the five screws [71] and ten washers [72] that attach the bracket [69] to the forward insulation panel [43].
- (h) Use a twine, G00472 or equivalent to temporarily attach the forward compartment light [70] and bracket [69] to the support structure.
- (i) Remove the two screws [65] and two washers [66] that attach the bracket [64] to the forward insulation panel [43].
- (j) Remove the bracket [64].
- (k) Remove the lockwire from the screw [67] and the fire extinguisher nozzle [75].
- (l) Remove the screw [67] and washer [68].
- (m) Remove the fire extinguisher nozzle [75] from the union.  
NOTE: You turn the fire extinguisher nozzle [75] counterclockwise to remove the nozzle.
- (n) Remove the three screws [59] and three washers [60] from the bottom forward corner of the forward drip shield and right forward drip shield.
- (o) Remove the 39 screws [59] and 39 washers [60] that attach the forward insulation panel [43] to the 1088 bulkhead.

**CAUTION:** BE CAREFUL WHEN YOU REMOVE THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (p) Carefully remove the forward insulation panel [43].  
NOTE: Put the four wire harnesses through the starter-generator firewall cover [44] while you remove the forward insulation panel [43].
- (q) Remove the four nuts [47], eight washers [46] and four screws [45] that attach the starter-generator bracket [48] to the forward insulation panel [43].
- (r) Remove the starter-generator bracket [48].
- (s) If it is necessary, remove the starter-generator firewall cover [44], right bracket firewall cover [52], left bracket firewall cover [63], forward rod firewall cover [73] and/or fuel fitting firewall cover [78] from the forward insulation panel [43]:  
NOTE: It is necessary to remove the firewall cover(s) if there is damage to the firewall cover(s) or to install these five firewall covers to a new or serviceable forward insulation panel [43].
  - 1) Remove the two screws [61] and two washers [62] that attach the starter-generator firewall cover [44] to the forward insulation panel [43].
  - 2) Remove the starter-generator firewall cover [44].
  - 3) Remove the forward rod firewall cover [73].
  - 4) Remove the four screws [76] and four washers [77] that attach the fuel fitting firewall cover [78] to the forward insulation panel [43].
  - 5) Remove the fuel fitting firewall cover [78].

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## AIRCRAFT MAINTENANCE MANUAL

- 6) Remove the four screws [80] and four washers [81] that attach the left bracket firewall cover [63] to the forward insulation panel [43].
- 7) Remove the left bracket firewall cover [63].
- 8) Remove the two screws [56] and two washers [57] that attach the right bracket firewall cover [52] to the forward insulation panel [43].
- 9) Remove the right bracket firewall cover [52].

SUBTASK 49-17-11-020-004

(4) Do these steps to remove the top insulation panel [32]:

- (a) Do the procedure in this task to remove the forward insulation panel [43].

**NOTE:** You must remove the forward insulation panel [43] before you can remove the top insulation panel [32].

- (b) Do this task: APU Mounts Removal, TASK 49-13-11-000-802.

**NOTE:** It is necessary to remove the firewall covers and the forward flameshield [84] for the removal of the top insulation panel [32].

- (c) Remove the three screws [97] and six washers [98] from the three clamps [96].
- (d) Remove the three clamps [96] from the wire harness [4] for the APU fire detector.
- (e) Remove the six screws [88] and six washers [89] that attach the APU fire detector [87] and the three brackets to the top insulation panel [32].
- (f) Remove the two bolts [82] and two washers [83] that attach the APU fire detector [87] to the top insulation panel [32].
- (g) Use a twine, G00472 or equivalent to temporarily attach the APU fire detector [87] and the wire harness [4] to the support structure.
- (h) Remove the two screws [93] and two washers [94] that attach the starter-generator flameshield [95] to the top insulation panel [32].
- (i) Remove the starter-generator flameshield [95].
- (j) Remove the two screws [90] and two washers [91] that attach the aft flameshield [92] to the top insulation panel [32].
- (k) Remove the aft flameshield [92].
- (l) Remove the 31 screws [85] and 31 washers [86] that attach the top insulation panel [32] to the APU compartment wall.

**CAUTION:** BE CAREFUL WHEN YOU REMOVE THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (m) Carefully remove the top insulation panel [32].

SUBTASK 49-17-11-020-006

(5) Do these steps to remove the right forward insulation panel [107]:

- (a) If the forward insulation panel [43] was not removed, disengage the forward insulation panel from the right forward insulation panel [107]:
  - 1) Remove the five screws [59] and five washers [60] that attach the forward insulation panel [43] to the right forward insulation panel [107].
  - 2) Remove the three screws [59] and three washers [60] from the bottom forward corner of the forward drip shield and right forward drip shield.
- (b) If the top insulation panel [32] was not removed, disengage the top insulation panel from the right forward insulation panel [107]:

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- 1) Remove the four screws [85] and four washers [86] that attach the top insulation panel [32] to the right forward insulation panel [107].
  - 2) Remove the screw [97] and two washers [98] that attach the clamp [96] on the top insulation panel [32] and the right forward insulation panel [107].
  - 3) Remove the five screws [101] and five washers [102] that attach the right firewall cover [103] to the right forward mount for the APU.
  - 4) Move the right firewall cover [103] down on the right forward mount for the APU.
- (c) Remove the five screws [109] and ten washers [110] from the five clamps [108].
  - (d) Remove the five clamps [108] from the wire harness [4] for the APU fire detector.
  - (e) Use a twine, G00472 or equivalent to temporarily attach the wire harness [4] to the support structure.
  - (f) Remove the four screws [104] and four washers [105] that attach the forward link flameshield [106] to the right forward insulation panel [107].
  - (g) Remove the forward link flameshield [106].
  - (h) Remove the 12 screws [99] and 12 washers [100] that attach the right forward insulation panel [107] to the APU compartment wall.

**CAUTION:** BE CAREFUL WHEN YOU REMOVE THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (i) Carefully remove the right forward insulation panel [107].

SUBTASK 49-17-11-020-007

- (6) Do these steps to remove the right aft insulation panel [123]:

- (a) Do the procedure in this task to remove the right forward insulation panel [107].

**NOTE:** You must remove the right forward insulation panel [107] before you can remove the right aft insulation panel [123].

- (b) If the top insulation panel [32] was not removed, disengage the top insulation panel from the right aft insulation panel [123]:
  - 1) Remove the five screws [85] and five washers [86] that attach the top insulation panel [32] to the right aft insulation panel [123].
  - 2) Remove the five screws [111] and five washers [112] that attach the forward firewall cover [113] to the right aft mount for the APU.
  - 3) Remove the five screws [117] and five washers [118] that attach the aft firewall cover [116] to the right aft mount for the APU.
  - 4) Move the forward firewall cover [113] and aft firewall cover [116] down on the right aft mount for the APU.
- (c) Disconnect the electrical connector [120] for the APU fire detector from the bracket [119].
- (d) Remove the two screws [121] and four washers [122] from the bracket [119].
- (e) Remove the bracket [119].
- (f) Remove the four screws [128] and eight washers [129] from the four clamps [127].
- (g) Remove the four clamps [127] from the wire harness [4] for the APU fire detector.
- (h) Remove the four screws [125] and eight washers [126] that attach the bracket [124] to the right aft insulation panel [123].
- (i) Use a twine, G00472 or equivalent to temporarily attach the aft compartment light and bracket [124] to the support structure.

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## AIRCRAFT MAINTENANCE MANUAL

- (j) Remove the three screws [114] and three washers [115] that attach the aft link flameshield [130] to the right aft insulation panel [123].
- (k) Remove the aft link flameshield [130].
- (l) Remove the two screws [131] and two washers [132] from the bottom aft corner of the right aft drip shield and aft drip shield.
- (m) Remove the 16 screws [131] and 16 washers [132] that attach the right aft insulation panel [123] to the APU compartment wall.

**CAUTION:** BE CAREFUL WHEN YOU REMOVE THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (n) Carefully remove the right aft insulation panel [123].

SUBTASK 49-17-11-020-008

- (7) Do these steps to remove the aft insulation panel [133]:

- (a) Do the procedure in this task to remove the top insulation panel [32].

**NOTE:** You must remove the top insulation panel [32] before you can remove the aft insulation panel [133].

- (b) Do the procedure in this task to remove the right aft insulation panel [123].

**NOTE:** You must remove the right aft insulation panel [123] before you can remove the aft insulation panel [133].

- (c) Remove the 11 screws [137] and 11 washers [138] that attach the eductor sleeve [139] to the eductor inlet duct.
- (d) Remove the eductor sleeve [139].
- (e) Remove the 16 bolts [140] and 16 washers [141] that attach the support ring bracket [134] to the aft insulation panel [133].
- (f) Remove the four screws [135] and four washers [136] that attach the support ring bracket [134] to the aft insulation panel [133].
- (g) Remove the support ring bracket [134].
- (h) Remove the 13 screws [142] and 13 washers [143] that attach the aft insulation panel [133] to the 1156 bulkhead.

**CAUTION:** BE CAREFUL WHEN YOU REMOVE THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (i) Carefully remove the aft insulation panel [133].

————— **END OF TASK** —————

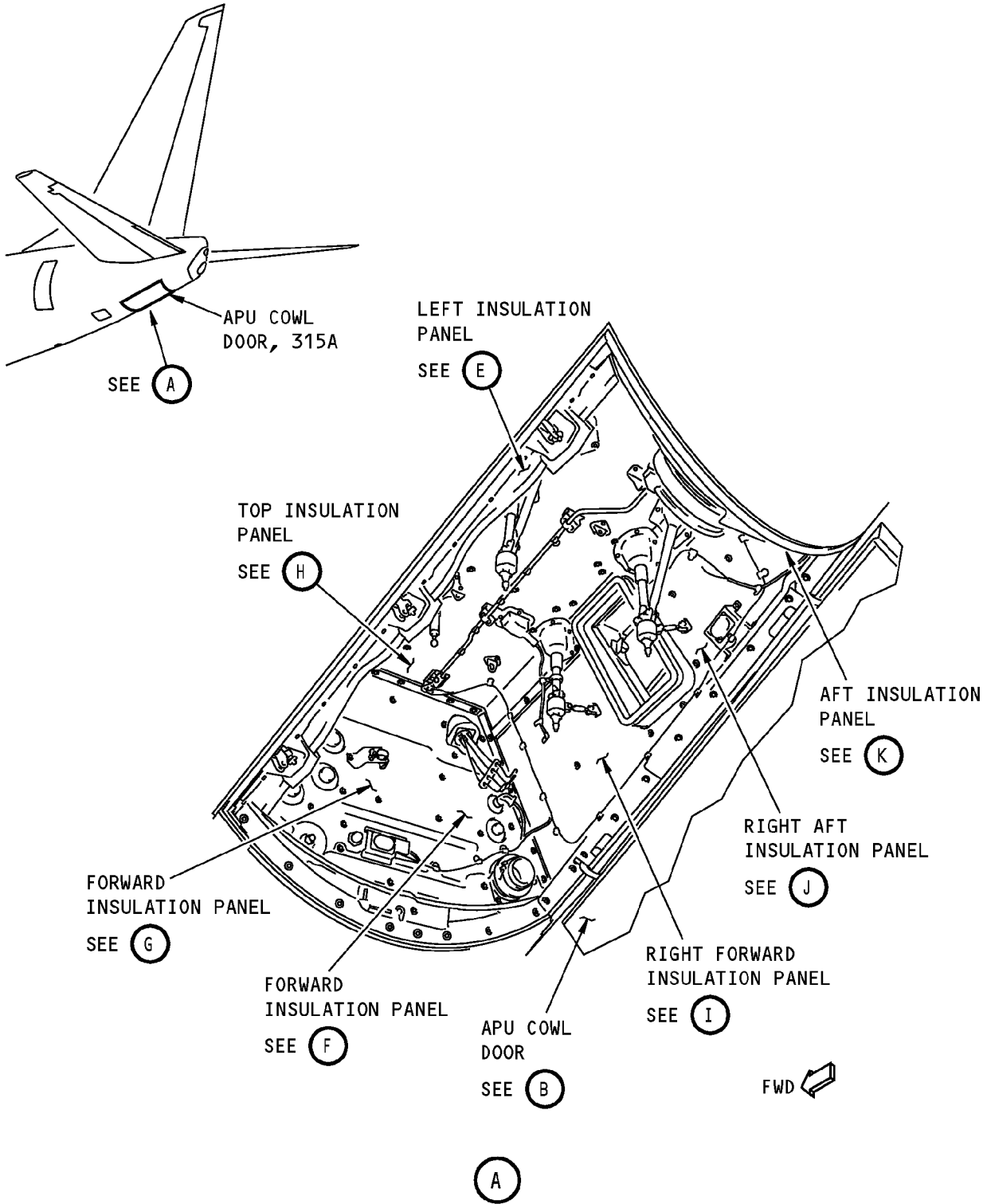
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AIRCRAFT MAINTENANCE MANUAL**



**Insulation Panel Installation  
Figure 401 (Sheet 1 of 10)/49-17-11-990-801**

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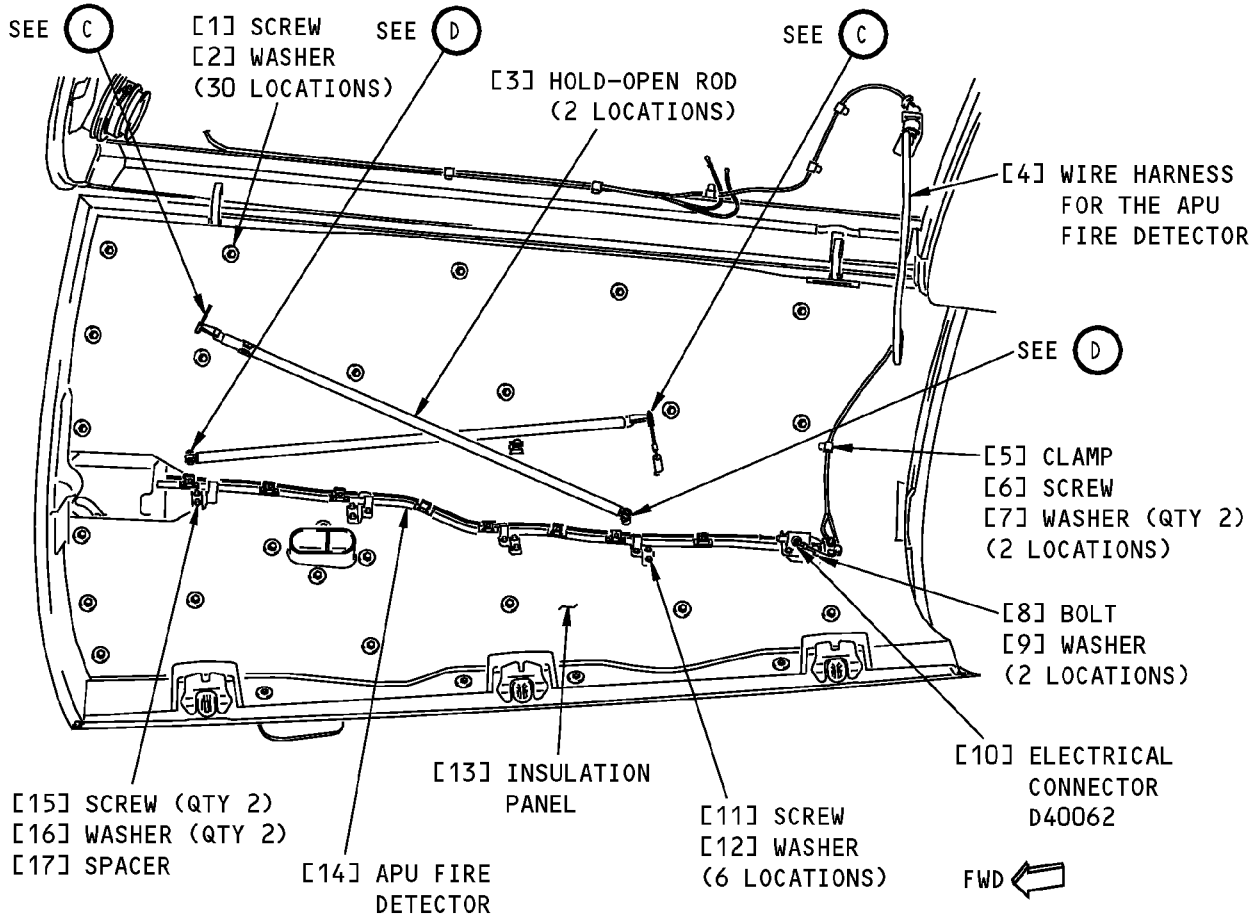
**49-17-11**

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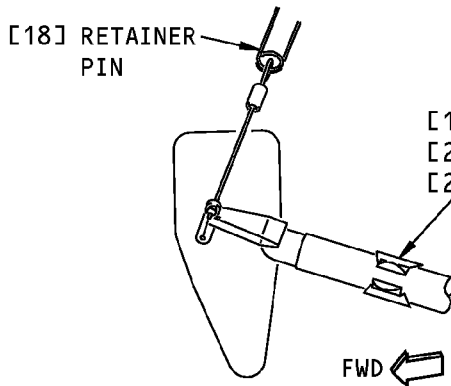


**AIRCRAFT MAINTENANCE MANUAL**

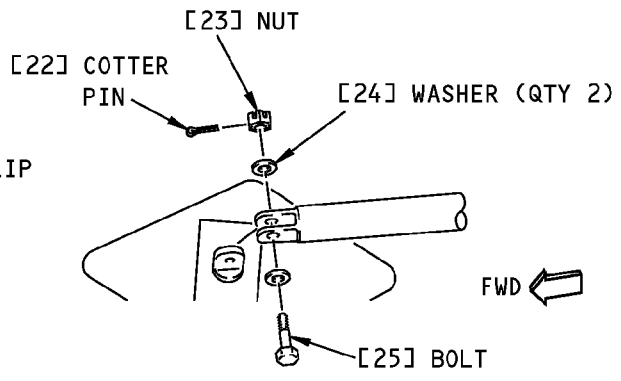


**APU COWL DOOR**

(B)



(C)



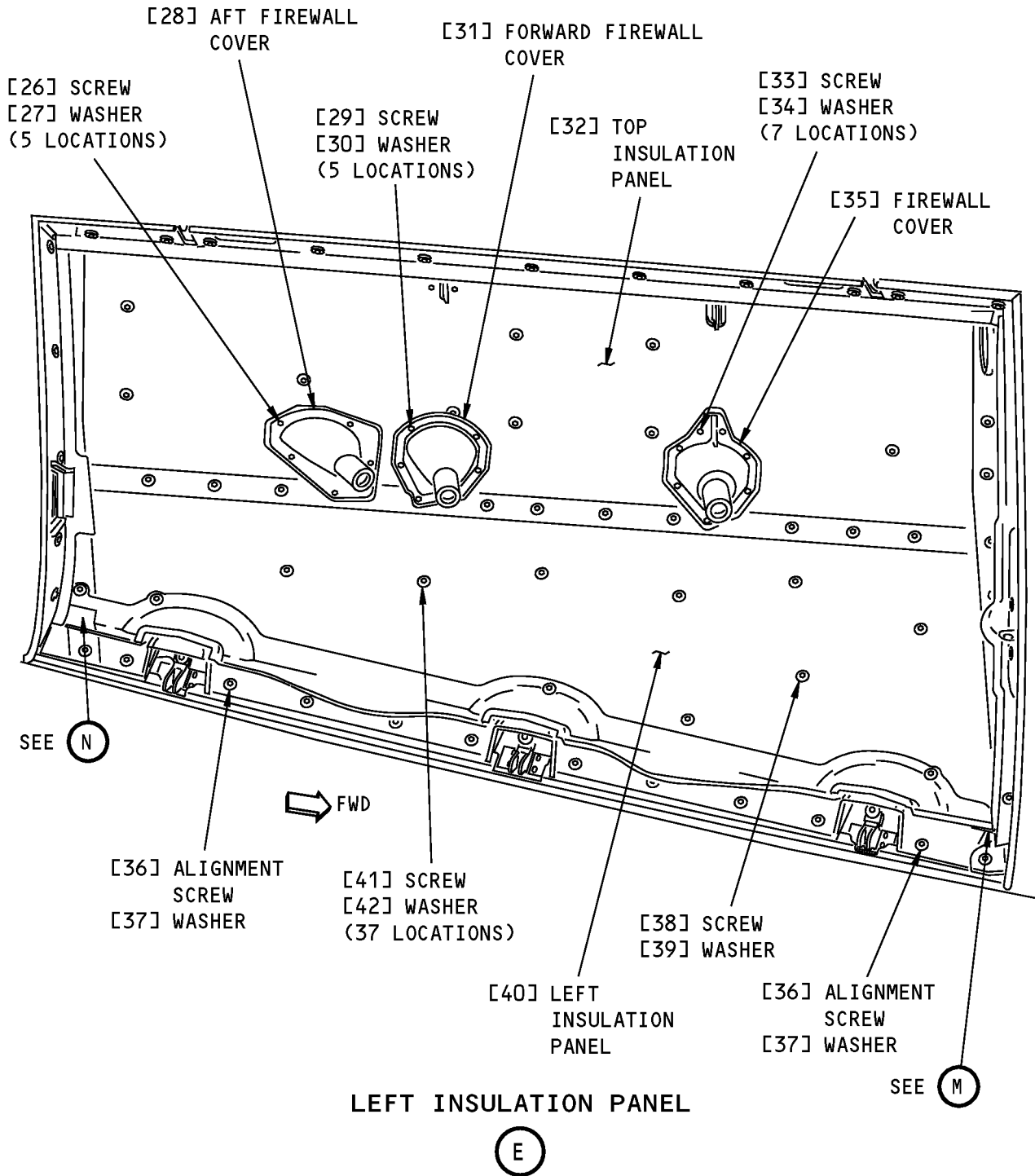
(D)

**Insulation Panel Installation**  
**Figure 401 (Sheet 2 of 10)/49-17-11-990-801**

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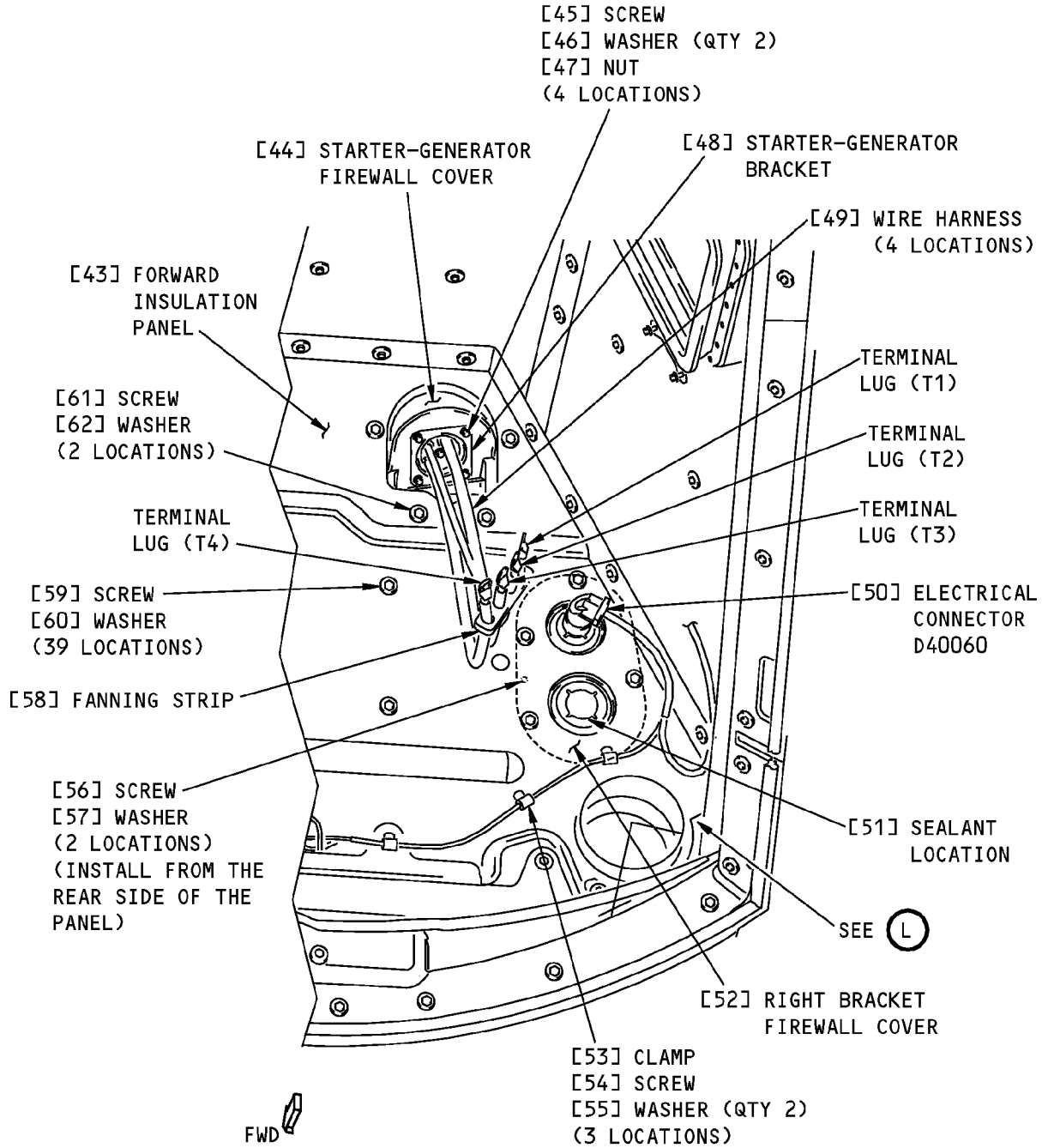


**Insulation Panel Installation**  
Figure 401 (Sheet 3 of 10)/49-17-11-990-801

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AIRCRAFT MAINTENANCE MANUAL**



**FORWARD INSULATION PANEL**

(F)

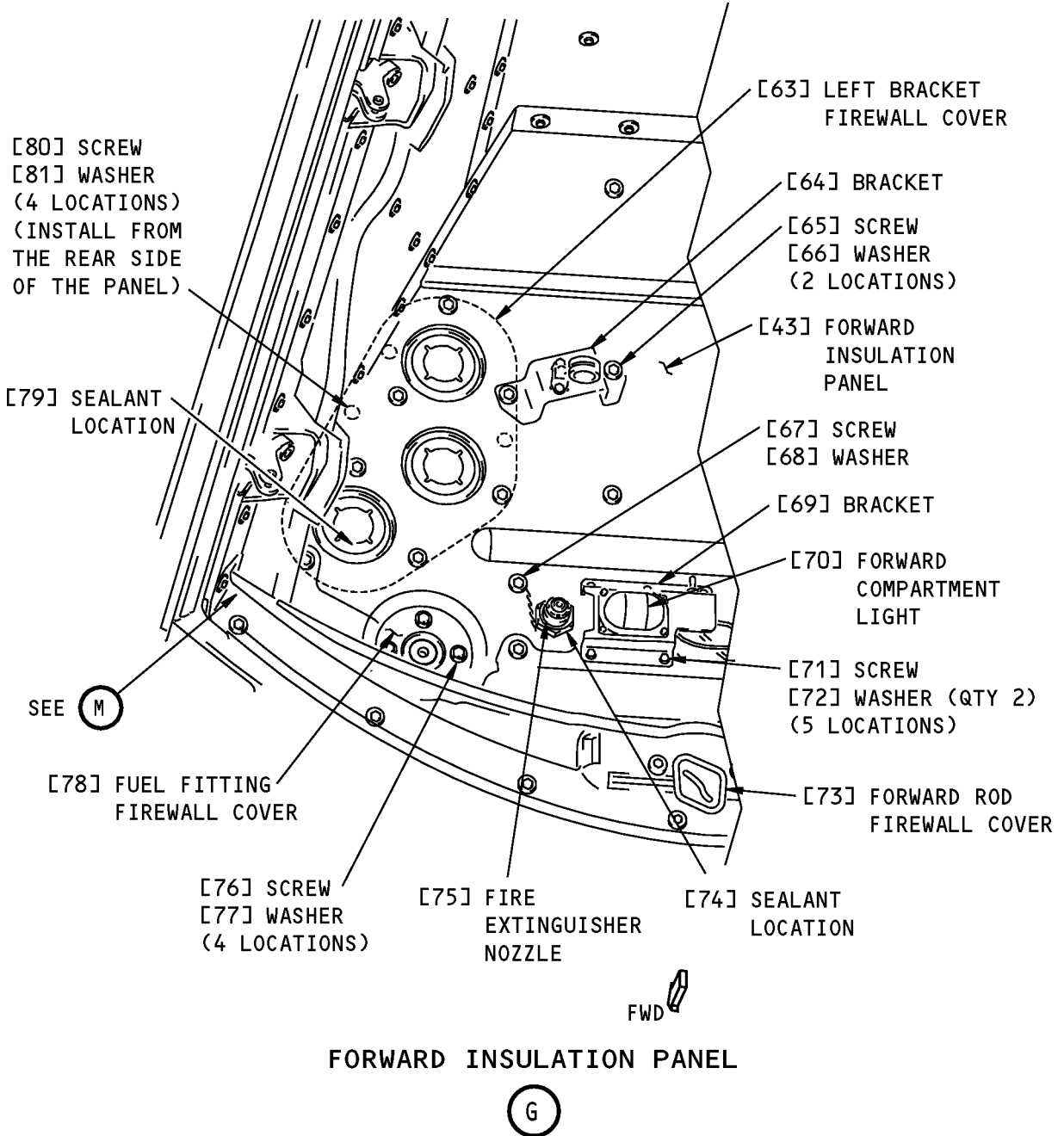
**Insulation Panel Installation  
Figure 401 (Sheet 4 of 10)/49-17-11-990-801**

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**Insulation Panel Installation  
Figure 401 (Sheet 5 of 10)/49-17-11-990-801**

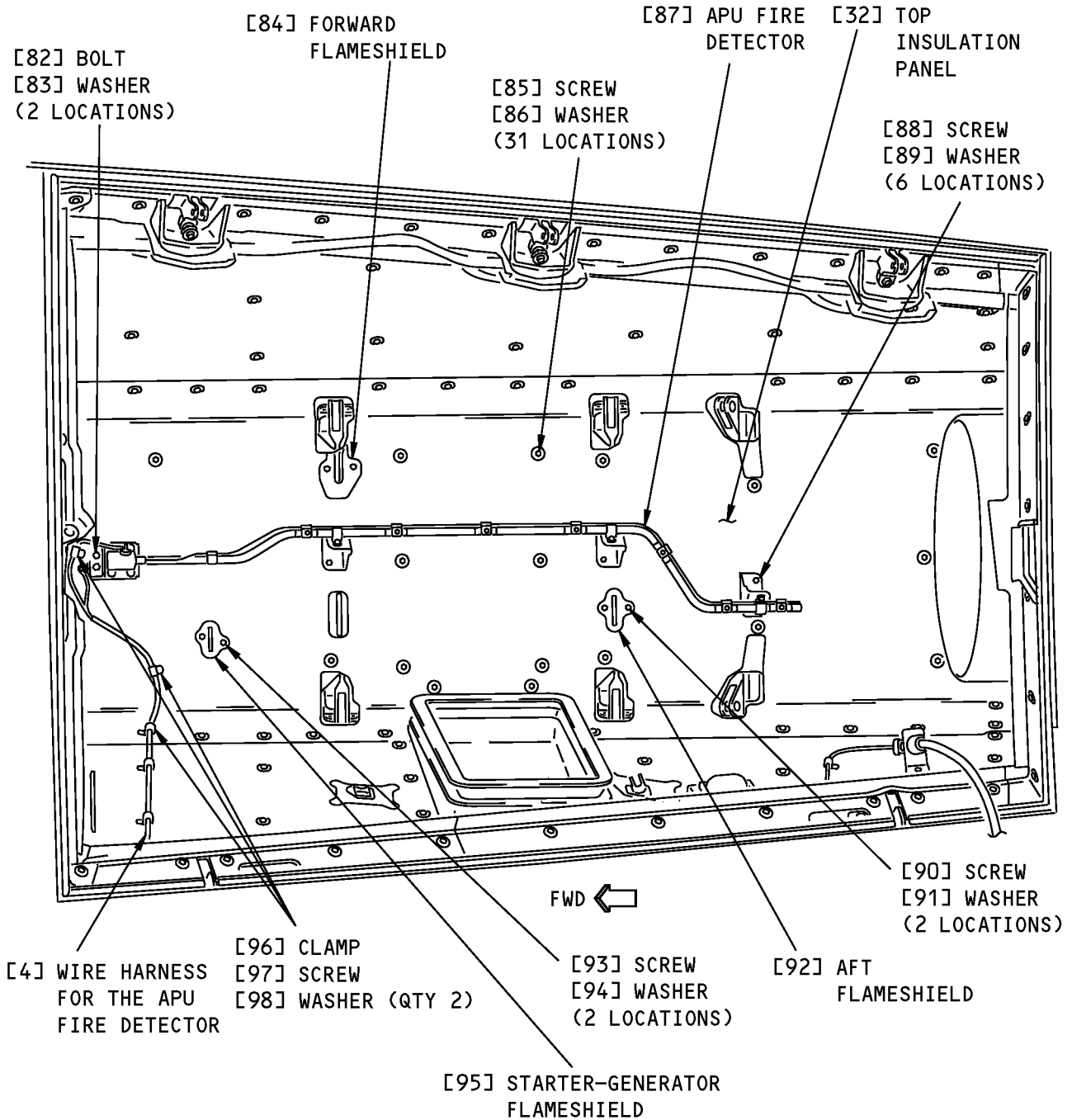
EFFECTIVITY  
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**AIRCRAFT MAINTENANCE MANUAL**



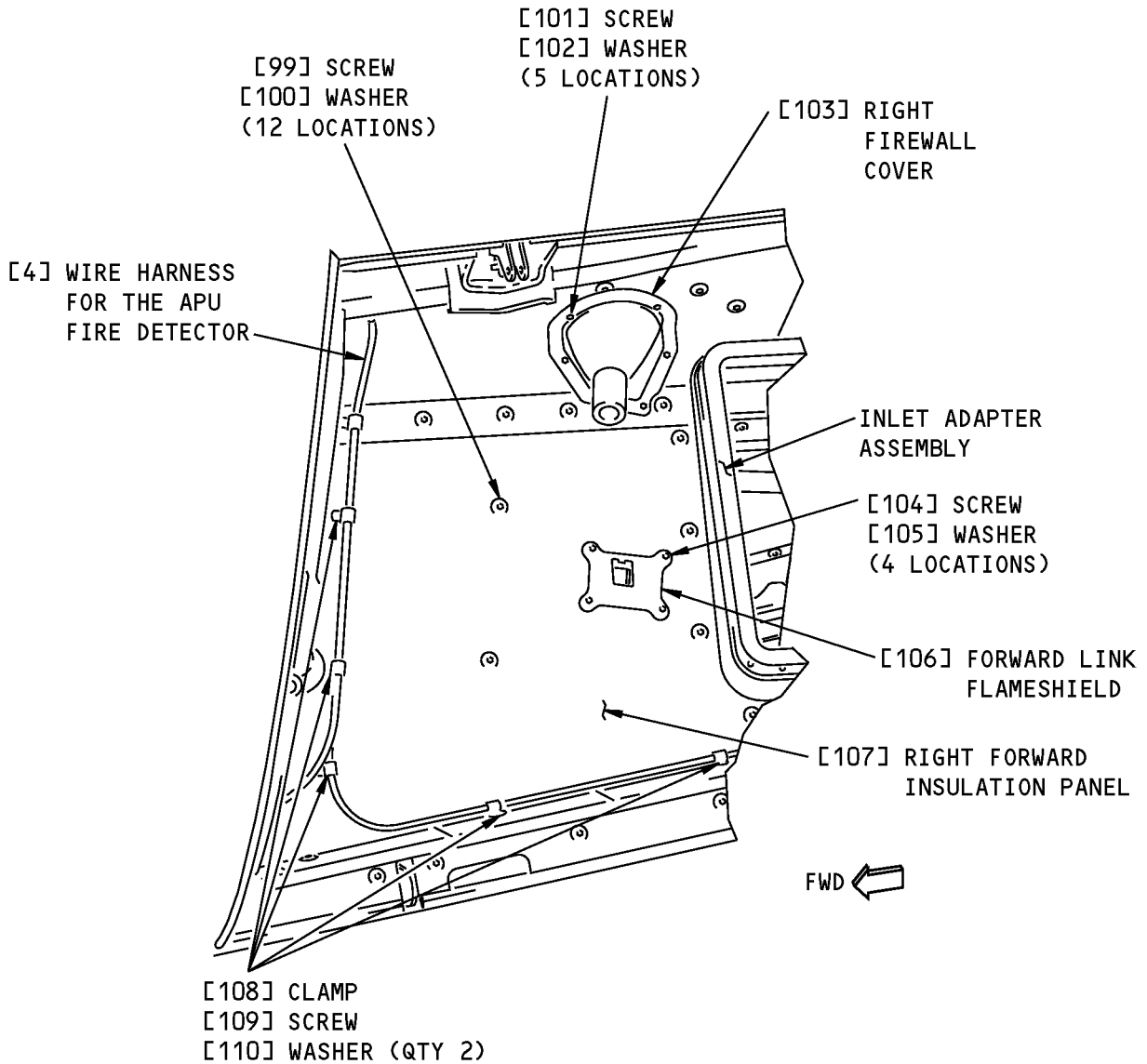
**TOP INSULATION PANEL**

(H)

**Insulation Panel Installation**  
**Figure 401 (Sheet 6 of 10)/49-17-11-990-801**

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**49-17-11**



**RIGHT FORWARD INSULATION PANEL**

I

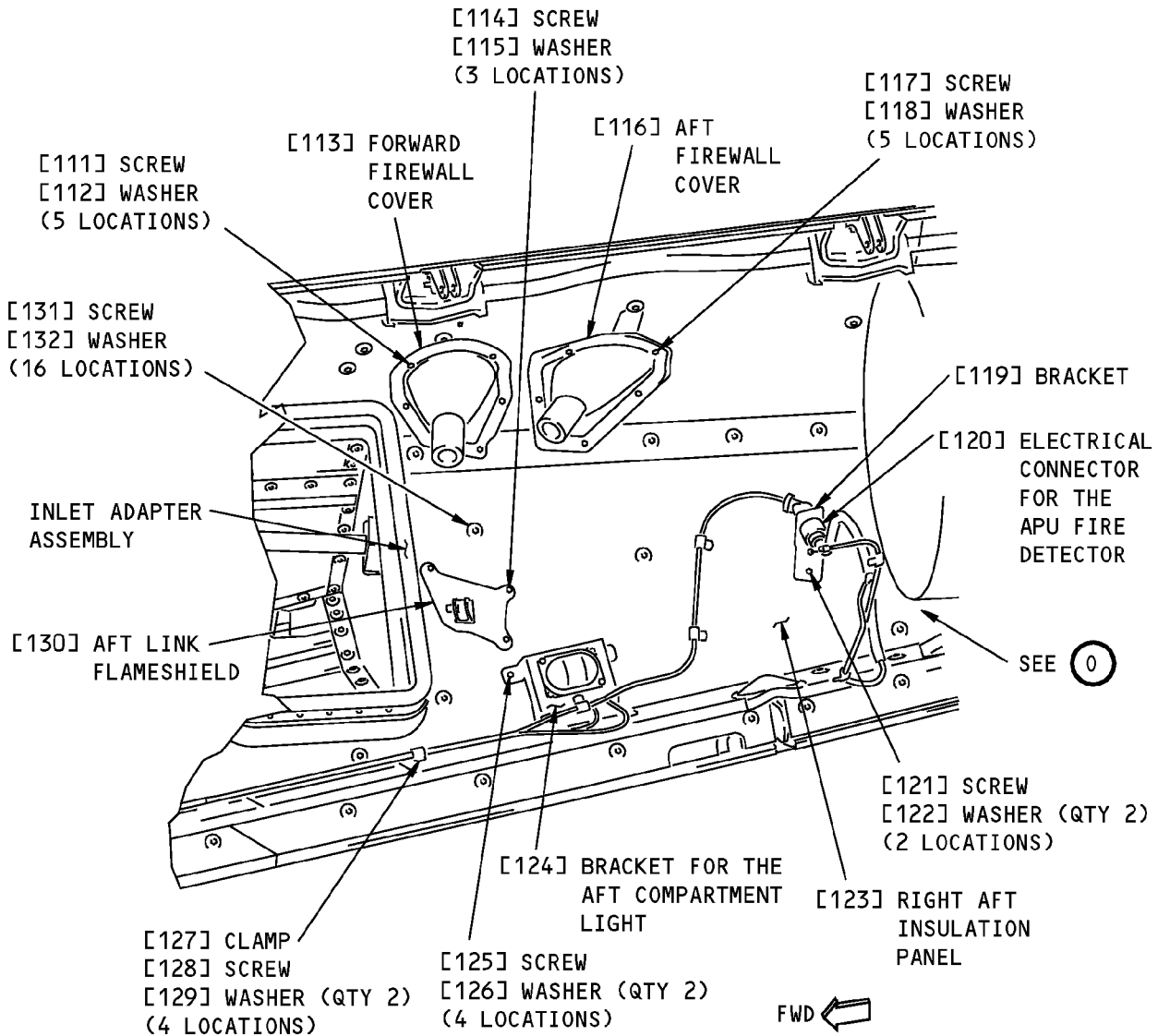
**Insulation Panel Installation  
Figure 401 (Sheet 7 of 10)/49-17-11-990-801**

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AIRCRAFT MAINTENANCE MANUAL**



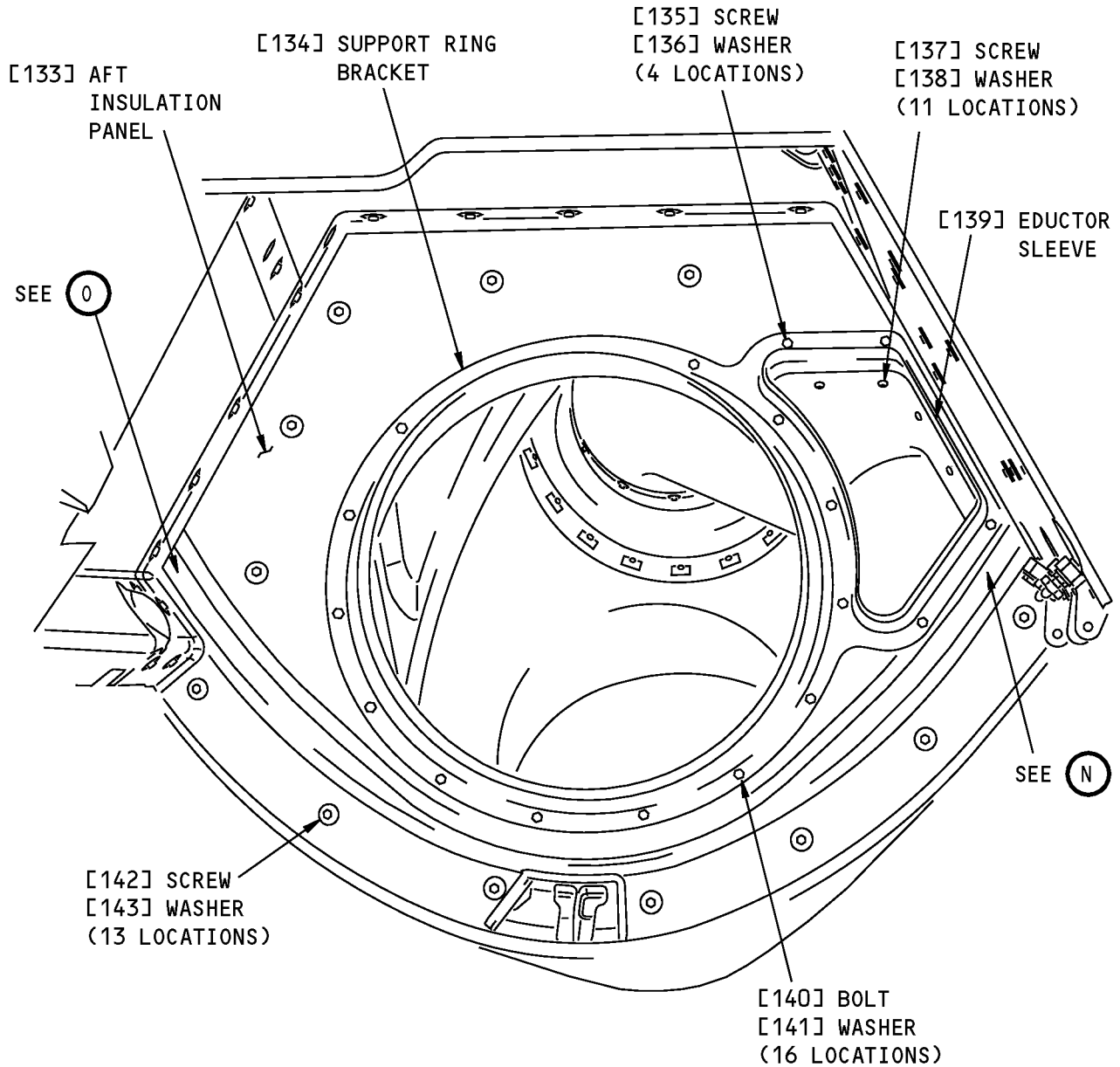
**RIGHT AFT INSULATION PANEL**

J

**Insulation Panel Installation  
Figure 401 (Sheet 8 of 10)/49-17-11-990-801**

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**AFT INSULATION PANEL  
(VIEW IN THE AFT DIRECTION)**

(K)

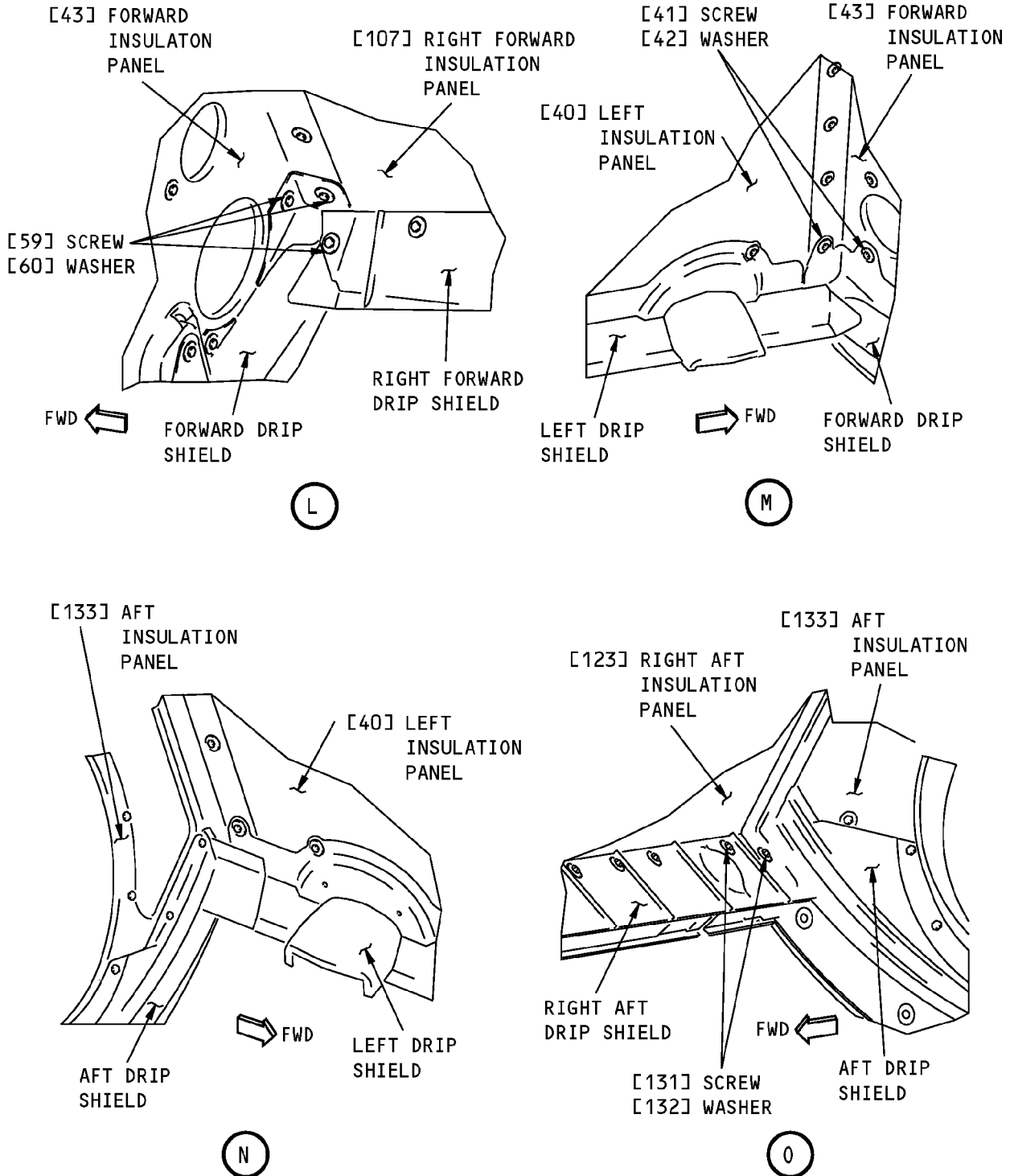
**Insulation Panel Installation  
Figure 401 (Sheet 9 of 10)/49-17-11-990-801**

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**Insulation Panel Installation**  
**Figure 401 (Sheet 10 of 10)/49-17-11-990-801**

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AIRCRAFT MAINTENANCE MANUAL

TASK 49-17-11-400-801

3. Insulation Panel Installation

(Figure 401)

A. References

Reference	Title
20-10-44-400-801	Lockwires Installation (P/B 401)
49-11-00-400-801	APU Power Plant Installation (P/B 401)
49-13-11-400-802	APU Mounts Installation (P/B 401)
52-48-21-400-801	Auxiliary Power Unit (APU) Cowl Door Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1064	Scraper - Phenolic, Hard Resin

C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G01048	Lockwire - Corrosion Resistant Steel (0.032 In. Dia.)	NASM20995~C32

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
13	Insulation panel	52-48-21-06-147	HAP 001, 006, 007
		52-48-21-07-300	HAP 101-999
		52-48-21-08-300	HAP 002-005, 008-013, 015-024
		52-48-21-09-005	HAP 025, 026, 028-054, 101-999
22	Cotter pin	52-48-21-06-048	HAP 001, 006, 007
		52-48-21-06-096	HAP 001, 006, 007
		52-48-21-07-130	HAP 101-999
		52-48-21-07-210	HAP 101-999
		52-48-21-08-130	HAP 002-005, 008-013, 015-026, 028-054
32	Top insulation panel	52-48-21-08-210	HAP 002-005, 008-013, 015-026, 028-054
		49-17-11-03-185	HAP 001-013, 015-026, 028-030
40	Left insulation panel	49-17-11-03A-280	HAP 031-054, 101-999
		49-17-11-03-200	HAP 001-013, 015-026, 028-030
		49-17-11-03A-265	HAP 031-054, 101-999

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AMM Item	Description	AIPC Reference	AIPC Effectivity
43	Forward insulation panel	49-17-11-03-050	HAP 001-013, 015-026, 028-030
		49-17-11-03A-085	HAP 031-054, 101-999
107	Insulation panel	49-17-11-03-270	HAP 001-013, 015-026, 028-030
		49-17-11-03A-335	HAP 031-054, 101-999
123	Right aft insulation panel	49-17-11-03-275	HAP 001-013, 015-026, 028-030
		49-17-11-03A-340	HAP 031-054, 101-999
133	Aft insulation panel	49-17-11-03-335	HAP 001-013, 015-026, 028-030
		49-17-11-03A-400	HAP 031-054, 101-999

#### E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### F. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### G. Procedure

SUBTASK 49-17-11-420-001

(1) Do these steps to install the aft insulation panel [133]:

**NOTE:** You must install the aft insulation panel [133] before you can install the other insulation panels on the APU compartment walls.

- (a) If you see remaining sealant on the parts of the aft insulation panel [133], then do these steps:
  - 1) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
  - 2) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.
  - 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

**CAUTION:** BE CAREFUL WHEN YOU INSTALL THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (b) Carefully put the aft insulation panel [133] on the 1156 bulkhead.
- (c) Use leather or thick cotton gloves to bend the bottom edge of the aft insulation panel [133] until there is a maximum clearance of 0.075 inch (1.9 mm) between the aft insulation panel and the aroaseal support bracket.

**NOTE:** The bottom edge of the aft insulation panel [133] must not touch the APU Cowl Door, 315A in the open and close positions.

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- (d) Install the 13 washers [143] and 13 screws [142] that attach the aft insulation panel [133] to the 1156 bulkhead.
- (e) Put the support ring bracket [134] on the aft insulation panel [133].
- (f) Install the four washers [136] and four screws [135] that attach the support ring bracket [134] to the aft insulation panel [133].
- (g) Install the 16 washers [141] and 16 bolts [140] that attach the support ring bracket [134] to the aft insulation panel [133].
- (h) Install the eductor sleeve [139] to the eductor inlet duct with the 11 washers [138] and 11 screws [137].

SUBTASK 49-17-11-420-002

(2) Do these steps to install the right aft insulation panel [123]:

- (a) If you see remaining sealant on the parts of the right aft insulation panel [123] and the inlet adapter assembly, then do these steps:
  - 1) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
  - 2) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.
  - 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

(b) Do the procedure in this task to install the aft insulation panel [133].

**NOTE:** You must install the aft insulation panel [133] before you can install the right aft insulation panel [123].

**CAUTION:** BE CAREFUL WHEN YOU INSTALL THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (c) Carefully put the right aft insulation panel [123] on the APU compartment wall.
- (d) Install the 16 washers [132] and 16 screws [131] that attach the right aft insulation panel [123] to the APU compartment wall.
- (e) Install the two washers [132] and two screws [131] on the bottom aft corner of the right aft drip shield and aft drip shield.
- (f) Install the aft link flameshield [130] with the three washers [115] and three screws [114].
- (g) Clean the surfaces of the bracket [119], the bracket for the aft compartment light [124] and the 12 washers [122], [126]:
  - 1) Remove the remaining sealant from the surfaces with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
  - 2) Clean the surfaces with alcohol, B00130 and a cotton wiper, G00034.
  - 3) Dry the surfaces with a cotton wiper, G00034.
- (h) Apply the sealant, A00247 to the eight washers [126].
- (i) Remove the temporary materials (cord or equivalent) that attach the aft compartment light and bracket [124] to the support structure.
- (j) Install the aft compartment light and bracket [124] with the eight washers [126] and four screws [125].

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- (k) Install the four clamps [127] on the wire harness [4] for the APU fire detector with the eight washers [129] and four screws [128].
- (l) Apply the sealant, A00247 to the four washers [122].
- (m) Install the bracket [119] with the four washers [122] and two screws [121].
- (n) Connect the electrical connector [120] for the APU fire detector to the bracket [119].
- (o) If the top insulation panel [32] was not removed, engage the top insulation panel to the right aft insulation panel [123]:
  - 1) If you see remaining sealant on the aft firewall cover [116], forward firewall cover [113] and the top insulation panel [32], then do these steps:
    - a) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
    - b) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.
    - c) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.
  - 2) Install the aft firewall cover [116] to the right aft mount for the APU with the five washers [118] and five screws [117].
  - 3) Install the forward firewall cover [113] to the right aft mount for the APU with the five washers [112] and five screws [111].
  - 4) Install the five washers [86] and five screws [85] that attach the top insulation panel [32] to the right aft insulation panel [123].
  - 5) Apply a fillet seal of sealant, A00160 between the forward firewall cover [113], aft firewall cover [116] and the top insulation panel [32].
  - 6) Apply a fillet seal of sealant, A00160 between the top insulation panel [32] and the right aft insulation panel [123].
  - 7) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.
- (p) Apply a fillet seal of sealant, A00160 between the inlet adapter assembly and the right aft insulation panel [123].
- (q) Apply a fillet seal of sealant, A00160 between the right aft insulation panel [123], aft insulation panel [133], right aft drip shield and aft drip shield.
- (r) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.

SUBTASK 49-17-11-420-003

- (3) Do these steps to install the right forward insulation panel [107]:
  - (a) If you see remaining sealant on the parts of the right forward insulation panel [107] and the inlet adapter assembly, then do these steps:
    - 1) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
    - 2) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.
    - 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.

NOTE: It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

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- (b) Do the procedure in this task to install the right aft insulation panel [123].

**NOTE:** You must install the right aft insulation panel [123] before you can install the right forward insulation panel [107].

**CAUTION:** BE CAREFUL WHEN YOU INSTALL THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (c) Carefully put the right forward insulation panel [107] on the APU compartment wall.
- (d) Install the 12 washers [100] and 12 screws [99] that attach the right forward insulation panel [107] to the APU compartment wall.
- (e) Install the forward link flameshield [106] with the four washers [105] and four screws [104].
- (f) Remove the temporary materials (cord or equivalent) that attach the wire harness [4] to the support structure.
- (g) Install the five clamps [108] on the wire harness [4] for the APU fire detector with the ten washers [110] and five screws [109].
- (h) If the top insulation panel [32] was not removed, engage the top insulation panel to the right forward insulation panel [107]:

- 1) If you see remaining sealant on the right firewall cover [103] and the top insulation panel [32], then do these steps:
  - a) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
  - b) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.
  - c) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

- 2) Install the right firewall cover [103] to the right forward mount for the APU with the five washers [102] and five screws [101].
  - 3) Install the clamp [96] on the top insulation panel [32] and the right forward insulation panel [107] with the two washers [98] and screw [97].
  - 4) Install the four washers [86] and four screws [85] that attach the top insulation panel [32] to the right forward insulation panel [107].
  - 5) Apply a fillet seal of sealant, A00160 between the right firewall cover [103] and the top insulation panel [32].
  - 6) Apply a fillet seal of sealant, A00160 between the top insulation panel [32] and the right forward insulation panel [107].
  - 7) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.
- (i) If the forward insulation panel [43] was not removed, engage the forward insulation panel to the right forward insulation panel [107]:
- 1) If you see remaining sealant on the right firewall cover [103] and the forward insulation panel [43], then do these steps:
    - a) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
    - b) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.

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- c) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

- 2) Install the five washers [60] and five screws [59] that attach the forward insulation panel [43] to the right forward insulation panel [107].
  - 3) Install the three washers [60] and three screws [59] on the bottom forward corner of the forward drip shield and right forward drip shield.
  - 4) Apply a fillet seal of sealant, A00160 between the forward insulation panel [43] and the right forward insulation panel [107].
  - 5) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.
- (j) Apply a fillet seal of sealant, A00160 between the inlet adapter assembly and the right forward insulation panel [107].
- (k) Apply a fillet seal of sealant, A00160 between the right forward insulation panel [107], right aft insulation panel [123] and right forward drip shield.
- (l) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.

SUBTASK 49-17-11-420-005

- (4) Do these steps to install the top insulation panel [32]:

- (a) If you see remaining sealant on the parts of the top insulation panel [32], then do these steps:
- 1) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
  - 2) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.
  - 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

- (b) Do the procedure in this task to install the right aft insulation panel [123].

**NOTE:** You must install the right aft insulation panel [123] before you can install the top insulation panel [32]. The aft insulation panel [133] is installed in the right aft insulation panel installation.

**CAUTION:** BE CAREFUL WHEN YOU INSTALL THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (c) Carefully put the top insulation panel [32] on the APU compartment wall.
- (d) Install the 31 washers [86] and 31 screws [85] that attach the top insulation panel [32] to the APU compartment wall.
- (e) Install the aft flameshield [92] with the two washers [91] and two screws [90].
- (f) Install the starter-generator flameshield [95] with the two washers [94] and two screws [93].
- (g) Remove the temporary materials (cord or equivalent) that attach the APU fire detector [87] and wire harness [4] to the support structure.
- (h) Install the APU fire detector [87] to the top insulation panel [32] with the two washers [83] and two bolts [82].

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- (i) Install the APU fire detector [87] and the three brackets to the top insulation panel [32] with the six washers [89] and six screws [88].
- (j) Install the three clamps [96] on the wire harness [4] for the APU fire detector with the six washers [98] and three screws [97].
- (k) Do this task: APU Mounts Installation, TASK 49-13-11-400-802.

**NOTE:** The firewall covers and the forward flameshield [84] are installed during the APU mounts installation.

- (l) Apply a fillet seal of sealant, A00160 between the top insulation panel [32] and the adjacent insulation panels.
- (m) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.

SUBTASK 49-17-11-420-006

(5) Do these steps to install the forward insulation panel [43]:

(a) If you see remaining sealant on the parts of the forward insulation panel [43] and the starter-generator bracket [48], then do these steps:

- 1) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
- 2) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.
- 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

(b) Do the procedure in this task to install the top insulation panel [32].

**NOTE:** You must install the top insulation panel [32] before you can install the forward insulation panel [43].

(c) If the starter-generator firewall cover [44], right bracket firewall cover [52], left bracket firewall cover [63], forward rod firewall cover [73] and/or fuel fitting firewall cover [78] were removed from the forward insulation panel [43], install the firewall covers:

- 1) Clean the surfaces of the right bracket firewall cover [52] and left bracket firewall cover [63]:
  - a) Remove the remaining sealant from the surfaces of the right bracket firewall cover [52] and left bracket firewall cover [63] with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
  - b) Clean the surfaces of the right bracket firewall cover [52] and left bracket firewall cover [63] with alcohol, B00130 and a cotton wiper, G00034.
  - c) Dry the surfaces of the right bracket firewall cover [52] and left bracket firewall cover [63] with a cotton wiper, G00034.
- 2) Apply the sealant, A00247 to the faying surfaces of the right bracket firewall cover [52].
- 3) Install the right bracket firewall cover [52] with the two washers [57] and two screws [56].
- 4) Apply the sealant, A00247 to the faying surfaces of the left bracket firewall cover [63].
- 5) Install the left bracket firewall cover [63] with the four washers [81] and four screws [80].
- 6) Install the fuel fitting firewall cover [78] with the four washers [77] and four screws [76].
- 7) Install the forward rod firewall cover [73].

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- 8) Install the starter-generator firewall cover [44] with the two washers [62] and two screws [61].
  - 9) Fill the space in the rear side of the right bracket firewall cover [52] and left bracket firewall cover [63] with the sealant, A00247 at the two sealant locations [51], [79].  
NOTE: It is necessary to fill the space with sealant to prevent fluids to collect there.
  - 10) Fill the space in the rear side of the union for the fire extinguisher nozzle [75] with the sealant, A00247 at the sealant location [74].
- (d) Apply the sealant, A00247 to the faying surfaces of the starter-generator bracket [48].
  - (e) Install the starter-generator bracket [48] to the starter-generator firewall cover [44] with the four screws [45], eight washers [46] and four nuts [47].
  - (f) Apply a fillet seal of sealant, A00247 on the four nuts [47].

**CAUTION:** BE CAREFUL WHEN YOU INSTALL THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (g) Carefully put the forward insulation panel [43] on the 1088 bulkhead.

NOTE: You must install the aft, right aft, right forward and top insulation panels before you can install the forward insulation panel [43].

- (h) Put the four wire harnesses [49] through the starter-generator firewall cover [44] while you install the forward insulation panel [43].

NOTE: Use the four identification tags for the correct installation of the four wire harnesses to the four hole locations on the starter-generator firewall cover [44].

- (i) If it is necessary, remove the four identification tags.
- (j) Install the 39 washers [60] and 39 screws [59] that attach the forward insulation panel [43] to the 1088 bulkhead.
- (k) Install the three washers [60] and three screws [59] on the bottom forward corner of the forward drip shield and right forward drip shield.
- (l) Install the fanning strip [58] to the four wire harnesses [49].

NOTE: The fanning strip show the identification of the four terminal lugs (T1), (T2), (T3) and (T4) for the four wire harnesses.

- (m) Make sure you install the four wire harnesses to the correct locations on the fanning strip [58].
- (n) Install the fire extinguisher nozzle [75] on the union.

NOTE: You turn the fire extinguisher nozzle [75] clockwise to install the nozzle.

- (o) Install the washer [68] and screw [67].
- (p) Install the lockwire, G01048 to the screw [67] and the fire extinguisher nozzle [75]. To install it, do this task: Lockwires Installation, TASK 20-10-44-400-801.
- (q) Install the bracket [64] with the two washers [66] and two screws [65].
- (r) Clean the surfaces of the bracket [69] for the forward compartment light and the ten washers [72]:
  - 1) Remove the remaining sealant from the surfaces with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
  - 2) Clean the surfaces with alcohol, B00130 and a cotton wiper, G00034.
  - 3) Dry the surfaces with a cotton wiper, G00034.

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- (s) Apply the sealant, A00247 to the ten washers [72].
- (t) Remove the temporary materials (cord or equivalent) that attach the forward compartment light [70] and bracket [69] to the support structure.
- (u) Install the bracket [69] to the forward insulation panel [43] with the ten washers [72] and five screws [71].
- (v) Install the three clamps [53] on the wire harness with the six washers [55] and three screws [54].
- (w) Connect the electrical connector D40060 [50] to the APU firewall receptacle on the 1088 bulkhead.
- (x) Apply a fillet seal of sealant, A00160 between the forward insulation panel [43], forward drip shield, right forward drip shield and the adjacent insulation panels.
- (y) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.

SUBTASK 49-17-11-420-009

- (6) Do these steps to install the left insulation panel [40]:
  - (a) If you see remaining sealant on the parts of the left insulation panel [40], then do these steps:
    - 1) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
    - 2) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.
    - 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

**CAUTION:** BE CAREFUL WHEN YOU INSTALL THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (b) Carefully put the left insulation panel [40] on the APU compartment wall.
- (c) Install the two washers [37] and two alignment screws [36] that attach the left insulation panel [40] to the APU compartment wall.

**NOTE:** It is necessary to align the left insulation panel [40] with the two alignment screws because of the small clearance between the lower edge of the left insulation panel and the APU Cowl Door, 315A..

- (d) Install the 37 washers [42] and 37 screws [41] that attach the left insulation panel [40] to the APU compartment wall.
- (e) Install the two washers [42] and two screws [41] on the bottom forward corner of the left drip shield and forward drip shield.
- (f) Install the washer [39] and screw [38] to the left insulation panel [40].
- (g) If you see remaining sealant on the aft firewall cover [28], forward firewall cover [31], firewall cover [35] and the top insulation panel [32], then do these steps:
  - 1) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
  - 2) Clean the surface with alcohol, B00130 and a cotton wiper, G00034.

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- 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surface.

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surface.

- (h) Install the aft firewall cover [28] to the left aft mount for the APU with the five washers [27] and five screws [26].
- (i) Install the forward firewall cover [31] to the left aft mount for the APU with the five washers [30] and five screws [29].
- (j) Install the firewall cover [35] to the left forward mount for the APU with the seven washers [34] and seven screws [33].
- (k) Apply a fillet seal of sealant, A00160 between the aft firewall cover [28], forward firewall cover [31], firewall cover [35] and the top insulation panel [32].
- (l) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.
- (m) Apply a fillet seal of sealant, A00160 between the left insulation panel [40], aft insulation panel [133], top insulation panel [32], forward insulation panel [43], aft drip shield, forward drip shield and left drip shield.
- (n) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.

SUBTASK 49-17-11-420-007

- (7) Do these steps to install the insulation panel [13] on the APU Cowl Door, 315A:

**CAUTION:** BE CAREFUL WHEN YOU INSTALL THE INSULATION PANEL. USE TWO PERSONS TO INSTALL THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (a) Carefully put the insulation panel [13] on the APU Cowl Door, 315A.
- (b) Install the 30 washers [2] and 30 screws [1] that attach the insulation panel [13] to the APU Cowl Door, 315A.
- (c) Install the APU fire detector [14] with the two washers [9] and two bolts [8].
- (d) Install the APU fire detector [14] with the six washers [12] and six screws [11].
- (e) Install the APU fire detector [14] with the spacer [17], two washers [16] and two screws [15].
- (f) Install the two clamps [5] on the wire harness [4] for the APU fire detector with the four washers [7] and two screws [6].
- (g) If the APU Cowl Door, 315A was not removed from the airplane, connect the electrical connector D40062 [10] to the APU fire detector [14].
- (h) Install the two spring clips [21] with the two washers [20] and two screws [19].
- (i) Install the two hold-open rods [3] with the two bolts [25], four washers [24] and two nuts [23].
- (j) Install the cotter pins [22] in the two nuts [23].

### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-17-11-410-003

- (1) If you installed the insulation panel [13] on the APU Cowl Door, 315A, close the APU Cowl Door, 315A:
- (a) If the access panel was removed from the airplane, install it by the following steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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- 1) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- 2) Install the retainer pin in the rod end of the forward hold-open rod.
- 3) Install the retainer pin to the spring clip on the aft hold-open rod.
- 4) Do this task: Auxiliary Power Unit (APU) Cowl Door Installation, TASK 52-48-21-400-801.

(b) If the access panel was not removed from the airplane, close it by doing these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- 1) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- 2) Install the retainer pin in the rod end of the forward hold-open rod.
- 3) Install the retainer pin to the spring clip on the aft hold-open rod.
- 4) Close the APU Cowl Door, 315A.
- 5) Close the three latches.

(c) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

(d) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-17-11-860-006

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	23	C00403	FIRE PROTECTION DETECTION APU

SUBTASK 49-17-11-420-008

(3) If you replaced one or more insulation panels on the APU compartment walls, install the APU. To install it, do this task: APU Power Plant Installation, TASK 49-11-00-400-801.

————— **END OF TASK** —————

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# AIRCRAFT MAINTENANCE MANUAL

## INSULATION PANEL - INSPECTION/CHECK

### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has the task to inspect the insulation panel. Seven insulation panels are installed on the APU cowl door and in the APU compartment.

#### **TASK 49-17-11-200-801**

### 2. Insulation Panel Inspection

#### A. General

- (1) This procedure is a scheduled maintenance task.

#### B. References

Reference	Title
49-11-00-000-801	APU Power Plant Removal (P/B 401)
49-11-00-400-801	APU Power Plant Installation (P/B 401)
49-17-11-000-801	Insulation Panel Removal (P/B 401)
49-17-11-300-801	Repair of the Insulation Panel (P/B 801)
49-17-11-400-801	Insulation Panel Installation (P/B 401)

#### C. Consumable Materials

Reference	Description	Specification
G01288	Tape - Carpet	BMS5-133
G02305	Tape - Insulation Blanket	BMS5-149

#### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### F. Prepare for the Inspection

SUBTASK 49-17-11-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-17-11-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-17-11-010-002

(3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

SUBTASK 49-17-11-010-001

(4) If it is necessary to remove the APU to do a full inspection of the seven insulation panels, do this task: APU Power Plant Removal, TASK 49-11-00-000-801.

NOTE: It is necessary to remove the APU to inspect all the surfaces of the top insulation panel.

NOTE: It is not necessary to remove the APU if you do a general visual inspection of the seven insulation panels.

### G. Procedure

#### HAP 001-013, 015-019

SUBTASK 49-17-11-210-001

- (1) Do these steps to inspect the insulation panels for fluid contamination and structural damage:
  - (a) Examine the insulation panels for signs of fluid contamination to the core insulation material.
  - (b) Examine the surface of the insulation panels for missing weld stitches, missing metal sheets, ruptured seams or structural metal deterioration.
  - (c) Examine the insulation panels for holes that have gone through the inner and outer metal sheets.
  - (d) If you find any of the above damage, replace the insulation panel(s). These are the tasks:
    - Insulation Panel Removal, TASK 49-17-11-000-801
    - Insulation Panel Installation, TASK 49-17-11-400-801
    - 1) After the insulation panel(s) are removed, examine the foam and support insulation for contamination and damage.

NOTE: You can find the foam and support insulation behind the insulation panel(s).
    - 2) If you find contamination or damage, remove the foam and/or support insulation.
    - 3) If it is necessary, examine the structure behind the support insulation for contamination and damage.
      - a) Clean and repair the problems that you find.

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## AIRCRAFT MAINTENANCE MANUAL

### HAP 001-013, 015-019 (Continued)

- 4) Replace the foam and/or support insulation before you install the insulation panel(s).

NOTE: Use tape, G01288 or tape, G02305 to install the support insulation to the bulkhead.

### HAP 020-026, 028-054, 101-999

SUBTASK 49-17-11-210-003

- (2) Do these steps to inspect the insulation panels for fluid contamination and structural damage:
  - (a) Examine the insulation panels for signs of fluid contamination to the core insulation material.
  - (b) Examine the surface of the insulation panels for missing weld stitches, missing metal sheets, ruptured seams or structural metal deterioration.
  - (c) Examine the insulation panels for holes that have gone through the inner and outer metal sheets.
  - (d) If you find any of the above damage, replace the insulation panel(s). These are the tasks:
    - Insulation Panel Removal, TASK 49-17-11-000-801
    - Insulation Panel Installation, TASK 49-17-11-400-801
    - 1) After the insulation panel(s) are removed, do these steps:
      - a) Examine the structure behind the insulation panel(s) for contamination and damage.
      - b) Examine the air inlet scoop for blockage of unwanted materials and damage that can cause a decrease in air flow.

NOTE: You can find the air inlet scoop behind the forward insulation panel.
      - c) If you find blockage of unwanted materials, remove the blockage.
      - d) If you find contamination or damage, clean and repair the problems that you find.

### HAP 001-013, 015-019

SUBTASK 49-17-11-210-002

- (3) Do these steps to inspect the insulation panels for other structural damage limits:
  - (a) Examine the outer metal sheet on the insulation panel for holes and tears.
    - 1) Holes less than 0.25 inch (6.4 mm) in diameter.
    - 2) Tears less than 4 inches (102 mm) in length.
  - (b) Examine the damaged areas of the insulation panels.
    - 1) If you find more than 0.5 inch (13 mm) of the outer metal sheet around the damaged area(s), you can repair the insulation panel.

NOTE: This limit includes the distance from the damaged area to a grommet, sharp bend, edge of the metal sheet or attaching parts.
  - (c) If you find the above damage and the damage is in the limits, do this task: Repair of the Insulation Panel, TASK 49-17-11-300-801.
  - (d) If you find the above damage and the damage is more than the limits, replace the insulation panel(s). These are the tasks:
    - Insulation Panel Removal, TASK 49-17-11-000-801

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## AIRCRAFT MAINTENANCE MANUAL

HAP 001-013, 015-019 (Continued)

- Insulation Panel Installation, TASK 49-17-11-400-801
  - 1) After the insulation panel(s) are removed, examine the foam and support insulation for contamination and damage.

NOTE: You can find the foam and support insulation behind the insulation panel(s).
  - 2) If you find contamination or damage, remove the foam and/or support insulation.
  - 3) If it is necessary, examine the structure behind the support insulation for contamination and damage.
    - a) Clean and repair the problems that you find.
  - 4) Replace the foam and/or support insulation before you install the insulation panel(s).

NOTE: Use tape, G01288 or tape, G02305 to install the support insulation to the bulkhead.

**HAP 020-026, 028-054, 101-999**

SUBTASK 49-17-11-210-004

- (4) Do these steps to inspect the insulation panels for other structural damage limits:
  - (a) Examine the outer metal sheet on the insulation panel for holes and tears.
    - 1) Holes less than 0.25 inch (6.4 mm) in diameter.
    - 2) Tears less than 4 inches (102 mm) in length.
  - (b) Examine the damaged areas of the insulation panels.
    - 1) If you find more than 0.5 inch (13 mm) of the outer metal sheet around the damaged area(s), you can repair the insulation panel.

NOTE: This limit includes the distance from the damaged area to a grommet, sharp bend, edge of the metal sheet or attaching parts.
  - (c) If you find the above damage and the damage is in the limits, do this task: Repair of the Insulation Panel, TASK 49-17-11-300-801.
  - (d) If you find the above damage and the damage is more than the limits, replace the insulation panel(s). These are the tasks:
    - Insulation Panel Removal, TASK 49-17-11-000-801
    - Insulation Panel Installation, TASK 49-17-11-400-801
    - 1) After the insulation panel(s) are removed, do these steps:
      - a) Examine the structure behind the insulation panel(s) for contamination and damage.
      - b) Examine the air inlet scoop for blockage of unwanted materials and damage that can cause a decrease in air flow.

NOTE: You can find the air inlet scoop behind the forward insulation panel.
      - c) If you find blockage of unwanted materials, remove the blockage.
      - d) If you find contamination or damage, clean and repair the problems that you find.

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SUBTASK 49-17-11-410-001

- (5) If the APU was removed during the inspection of the insulation panel(s), do this task: APU Power Plant Installation, TASK 49-11-00-400-801.

### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-17-11-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-17-11-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-17-11-410-002

- (3) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- Remove the two retainer pins from the two hold-open rods in the APU compartment.
- Disconnect the two hold-open rods from the two brackets.
- Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- Install the retainer pin in the rod end of the forward hold-open rod.
- Install the retainer pin to the spring clip on the aft hold-open rod.
- Close the APU Cowl Door, 315A.
- Close the three latches.

————— **END OF TASK** —————

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# AIRCRAFT MAINTENANCE MANUAL

## INSULATION PANEL - REPAIRS

### 1. General

- A. This procedure has the task to repair the insulation panel.
- B. There are seven insulation panels installed on the APU cowl door and in the APU compartment.

#### **TASK 49-17-11-300-801**

### 2. Repair of the Insulation Panel

#### A. Tools/Equipment

Reference	Description
STD-810	Spatula - Fillet Smoothing, Hardwood or Plastic
STD-1080	Brush - Paint

#### B. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00130	Alcohol - Isopropyl	TT-I-735
C00944	Primer - Firewall - Dapco No. 1-100	BMS5-63, Type I
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00744	Cloth - Emery	

#### C. Location Zones

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right

#### D. Damage Limits

SUBTASK 49-17-11-800-001

- (1) If the damage to the insulation panel is in these damage limits, you can repair the insulation panel:
  - (a) There is no fluid contamination or damage to the core insulation material.
  - (b) A hole must not go through the inner and outer metal sheets.
  - (c) The diameter of a hole through the outer metal sheet is not more than 0.25 inch (6.4 mm).
  - (d) A tear in the outer metal sheet is not longer than 4 inches (102 mm).
  - (e) A minimum of 0.5 inch (13 mm) of the metal sheet is around the damaged area. This limit includes the distance from the damaged area to a grommet, sharp bend, edge of the metal sheet or attaching parts.

#### E. Insulation Panel Repair

SUBTASK 49-17-11-220-001

- (1) Measure the damaged area of the insulation panel.
  - (a) Make sure the damaged area of the insulation panel is in the damage limits.

SUBTASK 49-17-11-390-001

- (2) Do these steps to apply the sealant to the damaged area of the outer metal sheet:

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**WARNING:** SHARP METAL EDGES CAN BE FOUND ON THE DAMAGED AREA OF THE OUTER METAL SHEET. BE CAREFUL WHEN YOU REMOVE THE SHARP METAL EDGES. SHARP METAL EDGES CAN CAUSE INJURY TO PERSONNEL.

- (a) Remove the sharp metal edges and loose materials that you can find from the damaged area of the outer metal sheet.

**CAUTION:** BE CAREFUL THAT YOU DO NOT PERMIT ALCOHOL TO TOUCH OR GO THROUGH THE CORE INSULATION MATERIAL. ALCOHOL AND OTHER FLUIDS WILL DECREASE THE PERFORMANCE AND MATERIAL PROPERTIES OF THE INSULATION PANEL.

- (b) Clean the damaged area with alcohol, B00130 and a cotton wiper, G00034.  
(c) Dry the surface of the outer metal sheet with a cotton wiper, G00034.

**NOTE:** You must apply the Dapco No. 1-100 primer, C00944 and sealant, A00160 in four hours after you clean the damaged area.

- (d) Make the surface of the outer metal sheet rough with a emery cloth, G00744 or equivalent.

**NOTE:** The rough surface of the outer metal sheet must extend a minimum of 0.5 inch (13 mm) around the damaged area.

- (e) Deburr the edges of the damaged area of the outer metal sheet with a emery cloth, G00744 or equivalent.

- (f) Clean the surface of the outer metal sheet with alcohol, B00130 and a cotton wiper, G00034.  
(g) Dry the surface of the outer metal sheet with a cotton wiper, G00034.

- (h) Use a paint brush, STD-1080 to apply a thin layer of Dapco No. 1-100 primer, C00944 to the rough surface of the outer metal sheet.

- 1) Let the Dapco No. 1-100 primer, C00944 dry for one hour but not longer than two hours.

**NOTE:** A chalky color on the outer metal sheet shows when the Dapco No. 1-100 primer, C00944 is dry.

- (i) Use a hardwood or plastic fillet smoothing spatula, STD-810 to apply a sufficient amount of sealant, A00160 to fill the empty area between the core insulation material and the outer metal sheet.

- (j) Use a paint brush, STD-1080 or hardwood or plastic fillet smoothing spatula, STD-810 to apply a thin layer of sealant, A00160 to the rough surface of the outer metal sheet.

**NOTE:** The thickness of the sealant, A00160 on the rough surface of the outer metal sheet is approximately 0.01 inch (0.25 mm).

- (k) Use a hardwood or plastic fillet smoothing spatula, STD-810 to make the sealant area smooth.

- (l) Remove the unwanted sealant, A00160 from the outer metal sheet with a cotton wiper, G00034.

- (m) Let the sealant, A00160 dry for a minimum of 48 hours at 70°F-80°F (21.1°C-26.7°C).

**NOTE:** You can use a heat lamp to decrease the time for the sealant, A00160 to dry. The time to dry with a heat lamp is four hours at 120°F (48.9°C).

————— END OF TASK —————

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## AIRCRAFT MAINTENANCE MANUAL

### AIR INLET SCOOP - INSPECTION/CHECK

#### 1. AIR INLET SCOOP - INSPECTION/CHECK

A. This procedure has the task to inspect the air inlet scoop.

**TASK 49-17-12-200-802**

#### 2. Air Inlet Scoop Inspection

(Figure 601)

A. Procedure

SUBTASK 49-17-12-210-003

(1) Do these steps to inspect the air inlet scoop [1] for blockage of material and structural damage:

(a) Examine the air inlet scoop [1] for blockage of unwanted materials and damage that can cause a decrease in air flow.

NOTE: You examine the air inlet scoop [1] from the outer surface of the airplane.

1) If you find blockage of unwanted materials, remove the blockage.

2) If you find contamination or damage, clean and repair the problems that you find.

————— **END OF TASK** —————

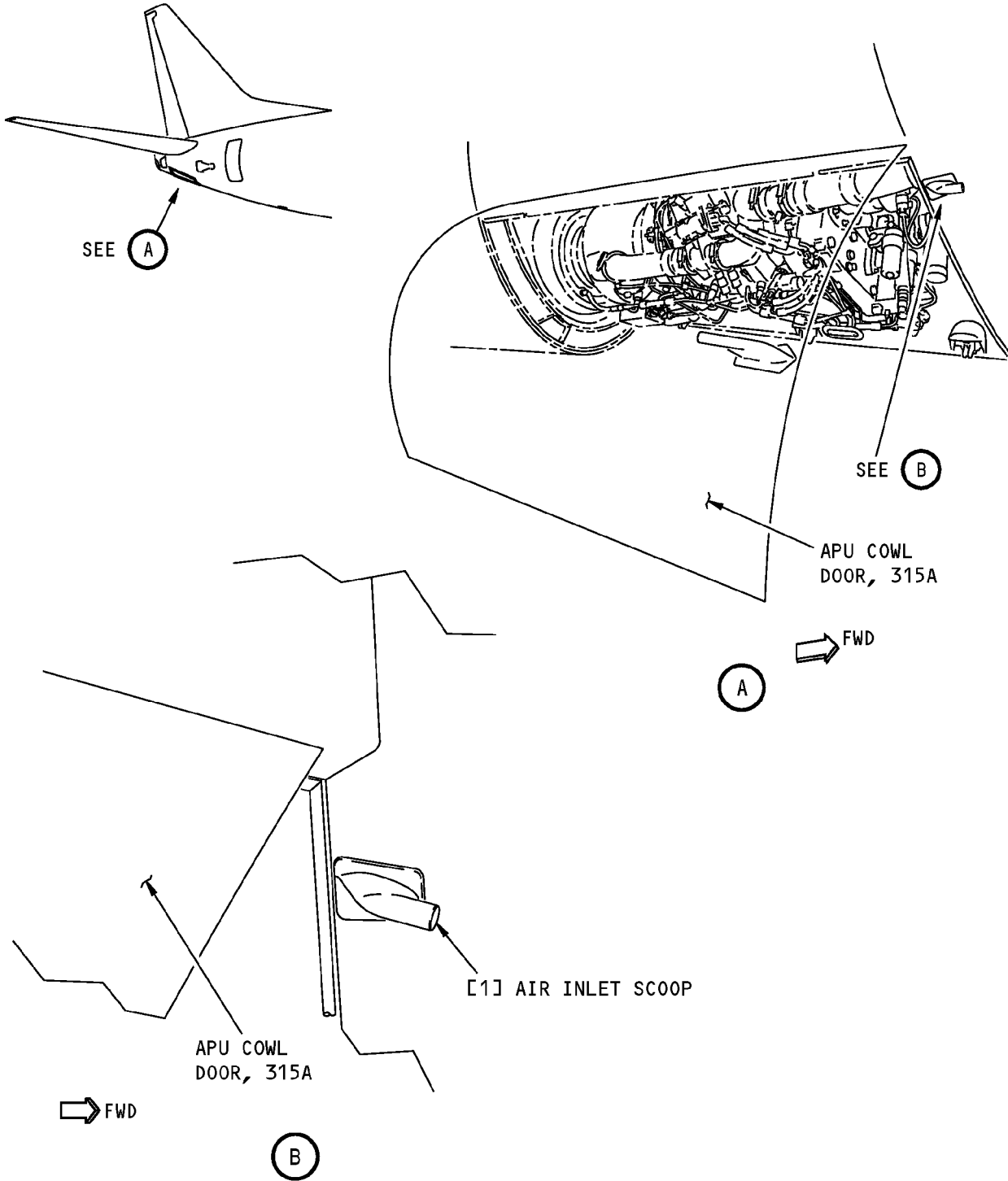
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**Air Inlet Scoop Inspection  
Figure 601/49-17-12-990-802**

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AIRCRAFT MAINTENANCE MANUAL**

**APU ENGINE - MAINTENANCE PRACTICES**

**1. General**

A. This procedure has the task to manually turn the APU engine.

**TASK 49-21-00-980-801**

**2. Manually Turn the APU Engine**

(Figure 201)

A. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236
G50225	Lockwire - Corrosion Resistant Steel, 0.020 inch diameter	NASM20995~ C20

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Plug	49-41-21-01-070	HAP 001-013, 015-026, 028-030
2	Packing	49-41-21-02-090	HAP 031-054, 101-999
		49-41-21-01-075	HAP 001-013, 015-026, 028-030
		49-41-21-02-095	HAP 031-054, 101-999

C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Prepare for the Inspection

SUBTASK 49-21-00-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-21-00-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-21-00-010-001

(3) Open this APU cowl door. To open this APU cowl door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU cowl door.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU cowl door.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

## F. Procedure

SUBTASK 49-21-00-980-001

(1) Do these steps to manually turn the APU engine:

- (a) Remove the lockwire that attach the plug [1] to the air/oil separator adapter [3].
- (b) Remove the plug [1] from the air/oil separator adapter [3].
- (c) Remove the packing [2] from the plug [1].
  - 1) Discard the packing [2].
- (d) Use a 1/4 inch hexagonal driver, a six inch extension and a ratchet wrench to turn the pinion gear of the air/oil separator adapter clockwise or counterclockwise.

NOTE: When you turn the pinion gear of the air/oil separator adapter, the APU will turn in the opposite direction.

SUBTASK 49-21-00-420-001

(2) Do these steps after you complete the procedure to manually turn the APU engine:

- (a) Remove the 1/4 inch hexagonal driver, six inch extension and ratchet wrench from the pinion gear of the air/oil separator adapter.
- (b) Lubricate the new packing [2] with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.
- (c) Install the packing [2] on the plug [1].
- (d) Install the plug [1] in the air/oil separator adapter [3].
  - 1) Tighten the plug [1] to 65 in-lb (7.3 N-m).
- (e) Install the lockwire, G50225 on the plug [1].

## G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-21-00-860-003

(1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-21-00-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-21-00-410-001

- (3) Close this APU cowl door. To close this APU cowl door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU cowl door.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU cowl door.
- (g) Close the three latches.

————— **END OF TASK** —————

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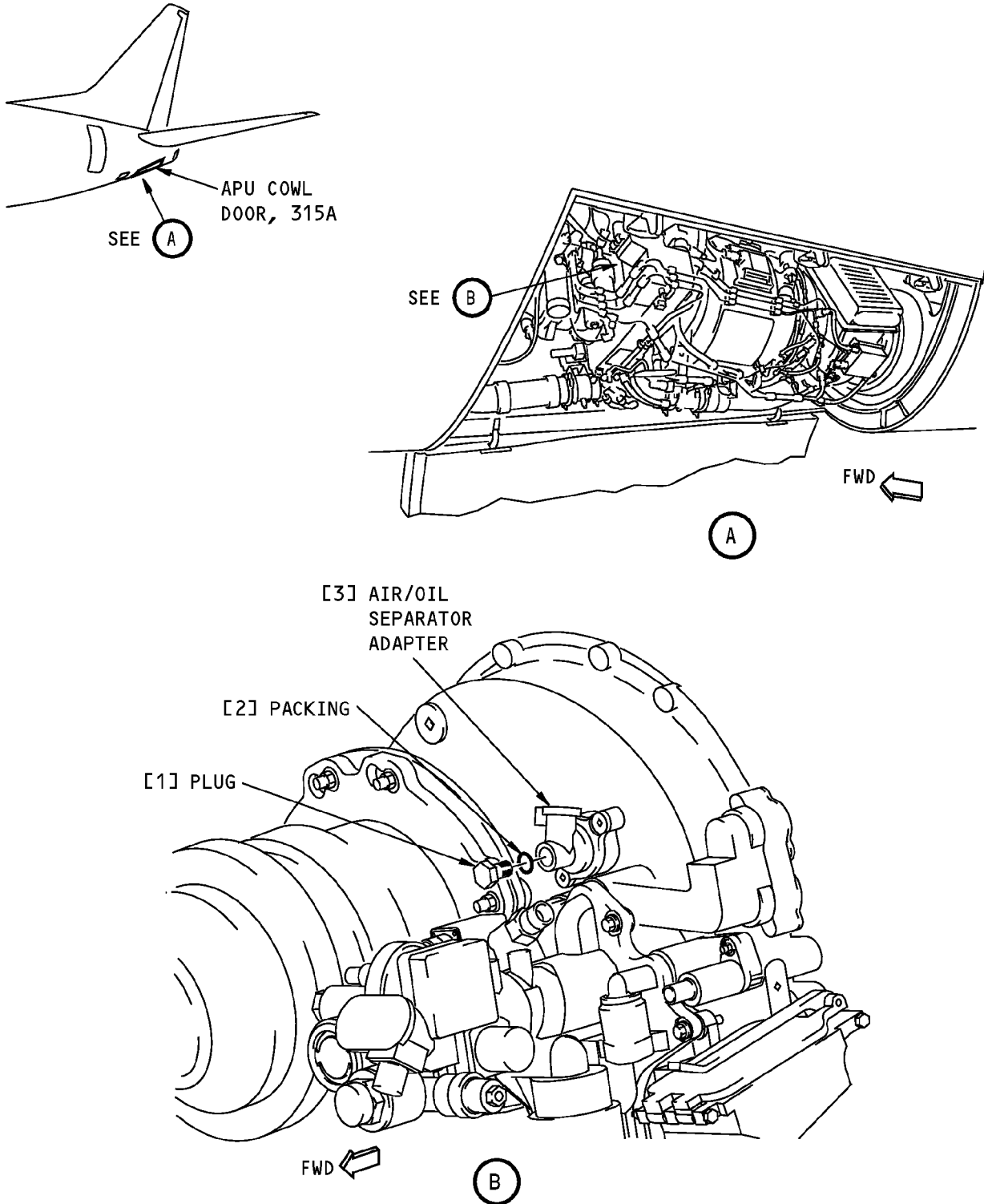
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**Manually Turn the APU Engine  
Figure 201/49-21-00-990-801**

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# AIRCRAFT MAINTENANCE MANUAL

## APU ENGINE - INSPECTION/CHECK

### 1. General

A. This procedure has these tasks to do an inspection of the internal parts of the APU engine. To do these inspections, you use a borescope to see the APU engine. These inspections are recommended when the performance of the APU engine decreases. You can see the performance data of the APU engine on the INPUT MONITORING page for the APU BITE TEST.

- (1) APU Engine Inspection
- (2) First Stage Stator and First Stage Turbine Inspection.

### **TASK 49-21-00-200-801**

### 2. APU Engine Inspection

(Figure 601)

#### A. References

Reference	Title
49-11-00-000-801	APU Power Plant Removal (P/B 401)
49-11-00-400-801	APU Power Plant Installation (P/B 401)
49-21-00-980-801	Manually Turn the APU Engine (P/B 201)
49-31-14-000-801	Fuel Nozzle Removal (P/B 401)
49-31-14-400-801	Fuel Nozzle Installation (P/B 401)
49-41-51-000-801	Igniter Plug Removal (P/B 401)
49-41-51-400-801	Igniter Plug Installation (P/B 401)
49-52-12-000-801	Inlet Guide Vane (IGV) Actuator Removal (P/B 401)
49-52-12-400-801	Inlet Guide Vane (IGV) Actuator Installation (P/B 401)
49-71-21-000-801	Exhaust Gas Temperature Thermocouple Removal (P/B 401)
49-71-21-400-801	Exhaust Gas Temperature Thermocouple Installation (P/B 401)

#### B. Tools/Equipment

**NOTE:** When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-4316	Borescope - Inspection, Flexible 6 mm (Olympus) (Part #: 7110561, Supplier: 32212, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: IF6C5X1-8, Supplier: 32212, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
COM-4964	Light Source - Borescope (Part #: 7502152, Supplier: 32212, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

#### C. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236
G01048	Lockwire - Corrosion Resistant Steel (0.032 In. Dia.)	NASM20995~ C32

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D. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

E. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

F. Prepare for the Inspection

SUBTASK 49-21-00-860-005

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-21-00-860-006

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-21-00-010-002

- (3) Open this APU cowl door. To open this APU cowl door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU cowl door.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU cowl door.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

G. Procedure

SUBTASK 49-21-00-940-001

- (1) Prepare the 6 mm flexible Olympus borescope, COM-4316 and light source, COM-4964 or equivalent to examine the internal parts of the APU.

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SUBTASK 49-21-00-290-001

- (2) Examine the vanes [17] of the load compressor diffuser and the blades [14] of the load compressor impeller:

**NOTE:** You examine the trailing edge of each blade on the load compressor impeller through the compressor housing boss. You examine the leading edge of each blade on the load compressor impeller through the access door at the bottom of the compressor inlet plenum.

- (a) Do this task: Manually Turn the APU Engine, TASK 49-21-00-980-801.
- (b) Remove the lockwire that attach the plug [1] to the compressor housing boss [5].
- (c) Remove the plug [1] from the compressor housing boss [5].
- (d) Remove the packing [2] from the plug [1].
  - 1) Discard the packing [2].
- (e) Put the 6 mm flexible Olympus borescope, COM-4316 through the compressor housing boss [5] and into the area of the load compressor diffuser [16].
- (f) Look at each vane [17] for these inspections:
  - 1) Bucket-shaped erosion damage is not permitted.
  - 2) Nicks and small erosion edge damage on the leading edge are permitted.
  - 3) Cracks in the brazed fillet area and across the vane are permitted.
  - 4) Vane discoloration is permitted.
- (g) Put the 6 mm flexible Olympus borescope, COM-4316 between the vanes [17] of the load compressor diffuser to get access to the blades [14] of the load compressor impeller [13].

**CAUTION:** MAKE SURE THAT THE FORWARD END OF THE BORESCOPE IS CLEAR OF THE BLADES OF THE LOAD COMPRESSOR IMPELLER. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE APU.

- (h) Look at the trailing edge and the surface of each blade [14] for these inspections:
  - 1) Missing pieces are not permitted.
  - 2) Cracks on the trailing edge, shroud line or hub are not permitted.
  - 3) Rub damage between the impeller and shroud or blade discoloration is permitted.
  - 4) Shroud abradable material on the trailing edge is permitted.
  - 5) Nicks and small erosion edge damage on the trailing edge are permitted.
- (i) Replace the APU if you found damage that was not permitted. These are the tasks:
  - APU Power Plant Removal, TASK 49-11-00-000-801,
  - APU Power Plant Installation, TASK 49-11-00-400-801.
- (j) Slowly remove the 6 mm flexible Olympus borescope, COM-4316 from the load compressor diffuser [16] and compressor housing boss [5].
- (k) Lubricate the new packing [2] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
- (l) Install the packing [2] on the plug [1].
- (m) Install the plug [1] in the compressor housing boss [5].
  - 1) Tighten the plug [1] to 80 in-lb (9.0 N·m).
- (n) Install the lockwire, G01048, on the plug [1].

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- (o) If it is not necessary to manually turn the APU engine for other inspection tasks, complete the procedure to manually turn the APU engine. To complete it, do this task: Manually Turn the APU Engine, TASK 49-21-00-980-801.

SUBTASK 49-21-00-290-002

- (3) Examine the inlet guide vanes (IGV) [15] and the blades [14] of the load compressor impeller:

**NOTE:** You examine the trailing edge of each blade on the load compressor impeller through the compressor housing boss. You examine the leading edge of each blade on the load compressor impeller through the access door at the bottom of the compressor inlet plenum.

- (a) Do this task: Manually Turn the APU Engine, TASK 49-21-00-980-801.  
(b) Loosen the eight captive screws [3] that attach the access door [4] to the compressor inlet plenum.  
(c) Remove the access door [4] from the compressor inlet plenum.

**NOTE:** A lanyard is attached to the access door to keep the access door with the APU.

- (d) Do this task: Inlet Guide Vane (IGV) Actuator Removal, TASK 49-52-12-000-801.  
(e) Use your hands to pull the linkage for the inlet guide vanes into the APU until the linkage stops and the inlet guide vanes are fully closed.  
(f) Put the 6 mm flexible Olympus borescope, COM-4316 through the compressor inlet duct and inlet housing to the inlet guide vanes [15].  
(g) Look at each of the closed inlet guide vanes [15] for these inspections:  
1) Missing vane(s) is not permitted.  
2) Bent vane is not permitted.  
3) Cracks on the vane are not permitted.  
4) Hit damage on all 16 IGV tips is not permitted.  
5) Nicks on the leading edge are permitted.  
6) Vane discoloration is permitted.  
(h) Use your hands to push the linkage for the inlet guide vanes into the APU until the linkage stops and the inlet guide vanes are fully open.  
(i) Look at each of the open inlet guide vanes [15] for these inspections:  
1) Missing vane(s) is not permitted.  
2) Bent vane is not permitted.  
3) Cracks on the vane are not permitted.  
4) Hit damage on all 16 IGV tips is not permitted.  
5) Nicks on the leading edge are permitted.  
6) Vane discoloration is permitted.  
(j) Put the 6 mm flexible Olympus borescope, COM-4316 through the inlet guide vanes [15] to get access to the blades [14].

**CAUTION:** MAKE SURE THAT THE FORWARD END OF THE BORESCOPE IS CLEAR OF THE BLADES OF THE LOAD COMPRESSOR IMPELLER. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE APU.

- (k) Look at the leading edge and the surface of each blade [14] for these inspections:  
1) More than two bent inducer blade tips are not permitted.

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## AIRCRAFT MAINTENANCE MANUAL

- 2) Missing pieces are not permitted.
  - 3) Cracks on the leading edge, fillets and/or hub are not permitted.
  - 4) Bent inducer blade tip for one blade only is permitted.
  - 5) Nicks and small erosion edge damage on the leading edge are permitted.
  - 6) Blade discoloration is permitted.
- (l) Replace the APU if you found damage that was not permitted. These are the tasks:
- APU Power Plant Removal, TASK 49-11-00-000-801,
  - APU Power Plant Installation, TASK 49-11-00-400-801.
- (m) Slowly remove the 6 mm flexible Olympus borescope, COM-4316 from the compressor inlet plenum and inlet duct.
- (n) Do this task: Inlet Guide Vane (IGV) Actuator Installation, TASK 49-52-12-400-801.
- (o) Install the access door [4] to the compressor inlet plenum with the eight captive screws [3].
- (p) If it is not necessary to manually turn the APU engine for other inspection tasks, complete the procedure to manually turn the APU engine. To complete it, do this task: Manually Turn the APU Engine, TASK 49-21-00-980-801.

SUBTASK 49-21-00-290-007

- (4) Examine the blades [19] of the engine compressor impeller [18]:

**NOTE:** You examine the leading edge of each blade of the engine compressor impeller through the access door at the bottom of the compressor inlet plenum.

**NOTE:** There is no access to the trailing edge of the engine compressor impeller blades with the APU installed in the APU compartment.

- (a) Do this task: Manually Turn the APU Engine, TASK 49-21-00-980-801.
- (b) Loosen the eight captive screws [3] that attach the access door [4] to the compressor inlet plenum.
- (c) Remove the access door [4] from the compressor inlet plenum.

**NOTE:** A lanyard is attached to the access door to keep the access door with the APU.

- (d) Put the 6 mm flexible Olympus borescope, COM-4316 through the compressor inlet duct access door and perforated inlet housing to examine the engine compressor impeller blades [19].

**CAUTION:** MAKE SURE THAT THE FORWARD END OF THE BORESCOPE IS CLEAR OF THE BLADES OF THE ENGINE COMPRESSOR IMPELLER. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE APU.

- (e) Look at the leading edge and the surface of each blade [19] for these inspections:
  - 1) Cracks on the leading edge, fillets and/or hub are not permitted.
  - 2) Missing pieces are not permitted.
  - 3) Rub damage between the impeller and shroud is permitted.
  - 4) Bent inducer main and/or splitter blade tip for one blade only is permitted.
  - 5) Nicks and small erosion edge damage on the leading edge are permitted.
  - 6) Blade discoloration is permitted.
- (f) Put the 6 mm flexible Olympus borescope, COM-4316 through the engine compressor impeller to examine the engine compressor diffuser vanes.
- (g) Look at the diffuser vanes on the engine compressor for these inspections:

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- 1) Bucket-shaped erosion damage is not permitted.
- 2) Nicks and small erosion edge damage on the leading edge are permitted.
- 3) Cracks in the brazed fillet area and across the vane are permitted.
- 4) Vane discoloration is permitted.
- (h) Replace the APU if you found damage that were not permitted. These are the tasks:
  - APU Power Plant Removal, TASK 49-11-00-000-801,
  - APU Power Plant Installation, TASK 49-11-00-400-801.
- (i) Slowly remove the 6 mm flexible Olympus borescope, COM-4316 from the compressor inlet plenum.
- (j) Install the access door [4] to the compressor inlet plenum with the eight captive screws [3].
- (k) If it is not necessary to manually turn the APU engine for other inspection tasks, complete the procedure to manually turn the APU engine. To complete it, do this task: Manually Turn the APU Engine, TASK 49-21-00-980-801.

SUBTASK 49-21-00-290-010

- (5) Examine the combustion chamber [25] and the ten fuel nozzles [30]:

**NOTE:** You can get access to the combustion chamber and the ten fuel nozzles through the igniter plug boss or through the fuel nozzle port on the combustor housing.

- (a) Do these steps to examine the combustion chamber [25] and the ten fuel nozzles [30] through the igniter plug boss [6]:
- 1) Do this task: Igniter Plug Removal, TASK 49-41-51-000-801.

**CAUTION:** MAKE SURE THAT THE INTERNAL TEMPERATURE OF THE APU IS LESS THAN 176°F (80°C) BEFORE YOU PUT THE BORESCOPE INTO THE APU. DAMAGE TO THE BORESCOPE CAN OCCUR.

- 2) Put the 6 mm flexible Olympus borescope, COM-4316 through the igniter plug boss [6] to get access to the combustion chamber [25] and the ten fuel nozzles [30].
- 3) Look at the combustion chamber [25] and ten fuel nozzles [30] for these inspections:
  - a) Hot spots with oxidation or erosion damage are not permitted.
  - b) Fuel nozzle shroud [31] with cracks, distortion or burn-through must be replaced with serviceable shroud. These are the tasks:
    - Fuel Nozzle Removal, TASK 49-31-14-000-801,
    - Fuel Nozzle Installation, TASK 49-31-14-400-801.
  - c) Missing thermal barrier coating is permitted.
  - d) Cracks between holes are permitted.
  - e) Panel discoloration is permitted.
- 4) Replace the APU if you found damage that was not permitted. These are the tasks:
  - APU Power Plant Removal, TASK 49-11-00-000-801,
  - APU Power Plant Installation, TASK 49-11-00-400-801.
- 5) Slowly remove the 6 mm flexible Olympus borescope, COM-4316 from the igniter plug boss [6].
- 6) Do this task: Igniter Plug Installation, TASK 49-41-51-400-801.

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- (b) Do these steps to examine the combustion chamber [25] and the fuel nozzles [30] through the fuel nozzle port [9] on the combustor housing:

**NOTE:** You can remove more than one fuel nozzle to get access to the combustion chamber. Obey the number of fuel nozzles that you can remove at the same time.

- 1) Do this task: Fuel Nozzle Removal, TASK 49-31-14-000-801.

**CAUTION:** MAKE SURE THAT THE INTERNAL TEMPERATURE OF THE APU IS LESS THAN 176°F (80°C) BEFORE YOU PUT THE BORESCOPE INTO THE APU. DAMAGE TO THE BORESCOPE CAN OCCUR.

- 2) Put the 6 mm flexible Olympus borescope, COM-4316 through the fuel nozzle port [9] to get access to the combustion chamber [25] and the fuel nozzles [30].
- 3) Look at the combustion chamber [25] and ten fuel nozzles [30] for these inspections:
- a) Hot spots with oxidation or erosion damage are not permitted.
  - b) Fuel nozzle shroud [31] with cracks, distortion or burn-through must be replaced with serviceable shroud. These are the tasks:
    - Fuel Nozzle Removal, TASK 49-31-14-000-801,
    - Fuel Nozzle Installation, TASK 49-31-14-400-801.
  - c) Missing thermal barrier coating is permitted.
  - d) Cracks between holes are permitted.
  - e) Panel discoloration is permitted.
- 4) Replace the APU if you found damage that were not permitted. These are the tasks:
  - APU Power Plant Removal, TASK 49-11-00-000-801,
  - APU Power Plant Installation, TASK 49-11-00-400-801.
- 5) Slowly remove the 6 mm flexible Olympus borescope, COM-4316 from the fuel nozzle port [9].
- 6) Do this task: Fuel Nozzle Installation, TASK 49-31-14-400-801.

SUBTASK 49-21-00-290-005

- (6) Examine the blades [22] of the second stage turbine [23]:

**NOTE:** You can get access to the blades through the fitting boss on the turbine exhaust port or through the port for the exhaust gas temperature (EGT) thermocouple 1 or EGT thermocouple 2.

**NOTE:** There is no access to the second stage stator vanes with the borescope.

- (a) Do this task: Manually Turn the APU Engine, TASK 49-21-00-980-801.
- (b) Do these steps to examine the blades [22] of the second stage turbine through the fitting boss [12] on the turbine exhaust port:
- 1) Disconnect the vent tube [10] from the fitting [11] on the turbine exhaust port.
  - 2) Remove the fitting [11].

**CAUTION:** MAKE SURE THAT THE INTERNAL TEMPERATURE OF THE APU IS LESS THAN 176°F (80°C) BEFORE YOU PUT THE BORESCOPE INTO THE APU. DAMAGE TO THE BORESCOPE CAN OCCUR.

- 3) Put the 6 mm flexible Olympus borescope, COM-4316 through the fitting boss [12] to get access to the blades [22].

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**CAUTION:** MAKE SURE THAT THE FORWARD END OF THE BORESCOPE IS CLEAR OF THE BLADES OF THE SECOND STAGE TURBINE. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE APU.

- 4) Look at each blade [22] for these inspections:
  - a) Missing blade is not permitted.
  - b) Cracks are not permitted.
  - c) Nicks on the leading edge, trailing edge and blade tip are permitted.
  - d) Erosion damage on the blade tip is permitted.
  - e) Missing flow discourager on the leading edge is permitted.
  - f) Blade discoloration is permitted.
- 5) Replace the APU if you found damage that were not permitted. These are the tasks:
  - APU Power Plant Removal, TASK 49-11-00-000-801,
  - APU Power Plant Installation, TASK 49-11-00-400-801.
- 6) Slowly remove the 6 mm flexible Olympus borescope, COM-4316 from the fitting boss [12].
- 7) Install the fitting [11] in the fitting boss [12] on the turbine exhaust port.
- 8) Connect the vent tube [10] to the fitting [11].
- (c) Do these steps to examine the blades [22] of the second stage turbine through the port for the EGT thermocouple 1 [7] or EGT thermocouple 2 [8]:
  - 1) Do this task: Exhaust Gas Temperature Thermocouple Removal, TASK 49-71-21-000-801.

**NOTE:** It is necessary to remove only one of the two EGT thermocouples.

**NOTE:** There is no access to the second stage stator vanes with the borescope.

**CAUTION:** MAKE SURE THAT THE INTERNAL TEMPERATURE OF THE APU IS LESS THAN 176°F (80°C) BEFORE YOU PUT THE BORESCOPE INTO THE APU. DAMAGE TO THE BORESCOPE CAN OCCUR.

- 2) Put the 6 mm flexible Olympus borescope, COM-4316 through the port for the EGT thermocouple 1 [7] or EGT thermocouple 2 [8] to get access to the blades [22].

**CAUTION:** MAKE SURE THAT THE FORWARD END OF THE BORESCOPE IS CLEAR OF THE BLADES OF THE SECOND STAGE TURBINE. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE APU.

- 3) Look at each blade [22] for these inspections:
  - a) Missing blade is not permitted.
  - b) Cracks are not permitted.
  - c) Nicks on the leading edge, trailing edge and blade tip are permitted.
  - d) Erosion damage on the blade tip is permitted.
  - e) Missing flow discourager on the leading edge is permitted.
  - f) Blade discoloration is permitted.
- 4) Replace the APU if you found damage that were not permitted. These are the tasks:
  - APU Power Plant Removal, TASK 49-11-00-000-801,

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- APU Power Plant Installation, TASK 49-11-00-400-801.
- 5) Slowly remove the 6 mm flexible Olympus borescope, COM-4316 from the port for the EGT thermocouple 1 [7] or EGT thermocouple 2 [8].
- 6) Do this task: Exhaust Gas Temperature Thermocouple Installation, TASK 49-71-21-400-801.
- (d) If it is not necessary to manually turn the APU engine for other inspection tasks, complete the procedure to manually turn the APU engine. To complete it, do this task: Manually Turn the APU Engine, TASK 49-21-00-980-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-21-00-860-007

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-21-00-860-008

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-21-00-410-002

- (3) Close this APU cowl door. To close this APU cowl door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU cowl door.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU cowl door.
- (g) Close the three latches.

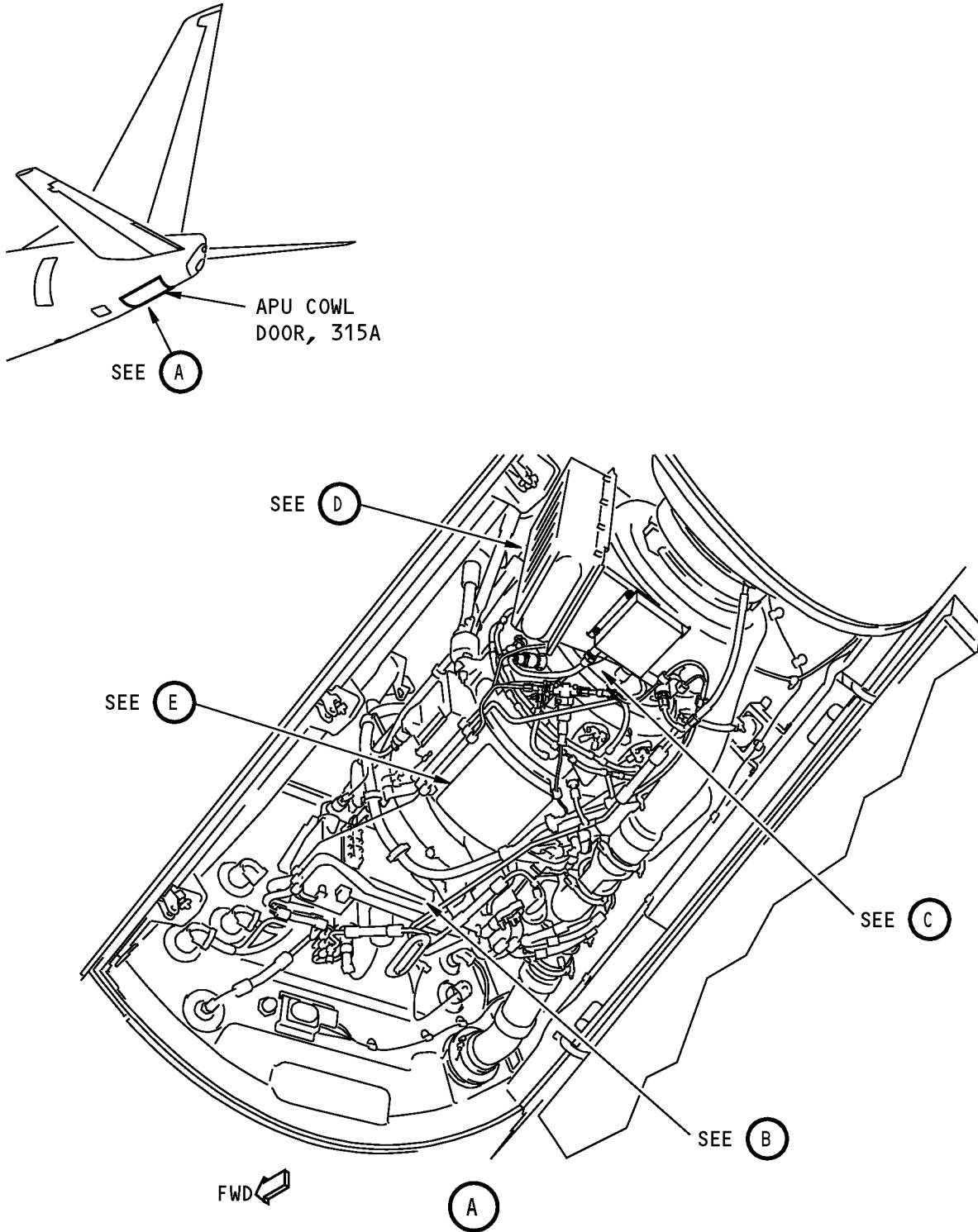
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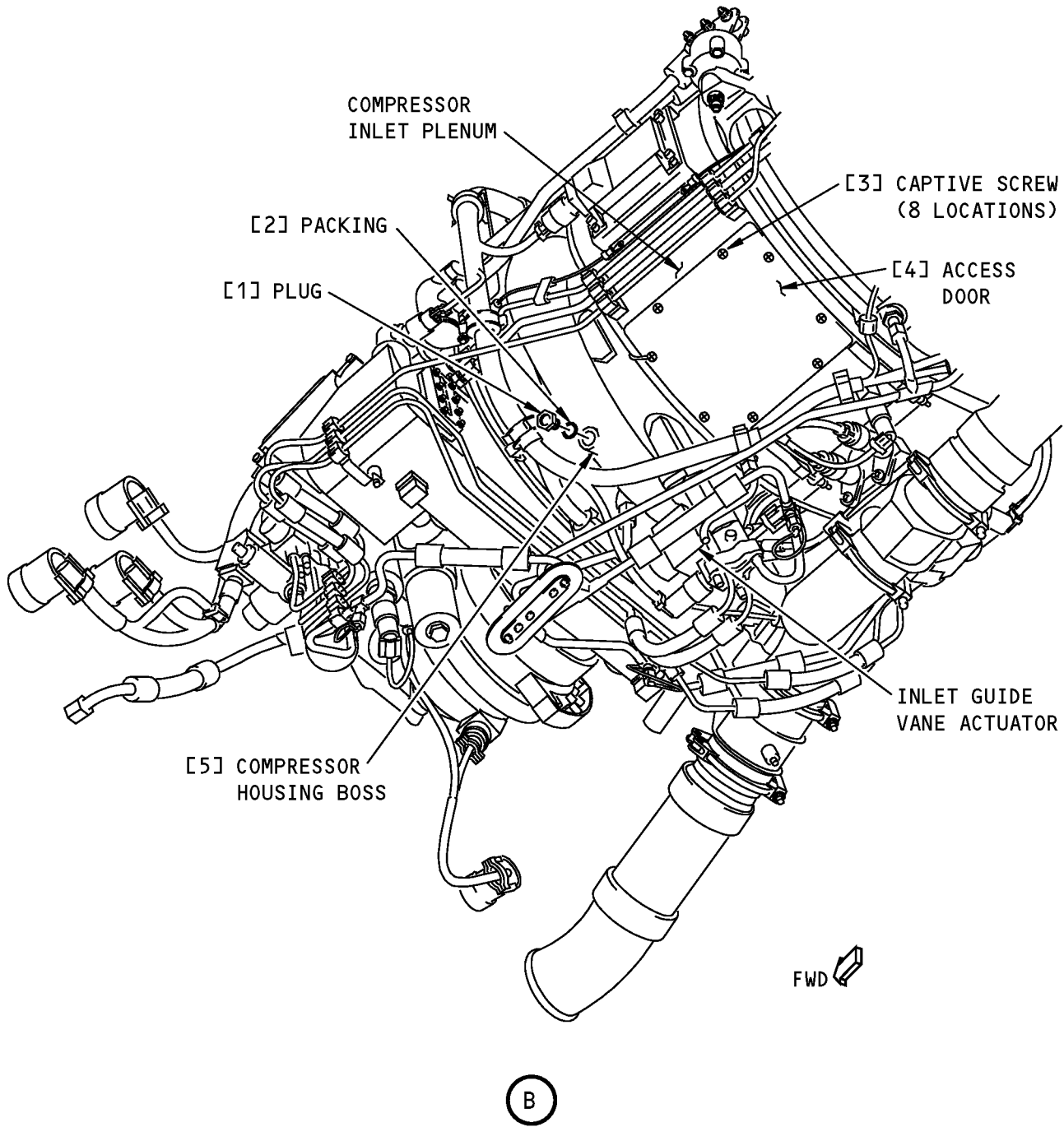
**APU Engine Inspection**  
**Figure 601 (Sheet 1 of 16)/49-21-00-990-802**

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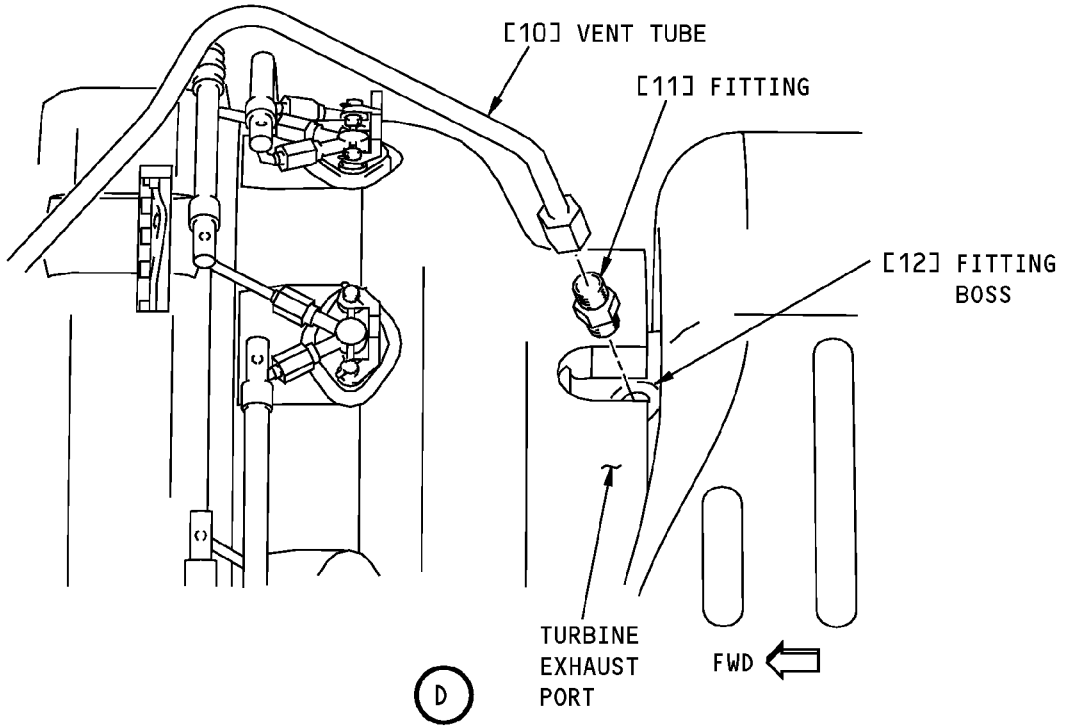
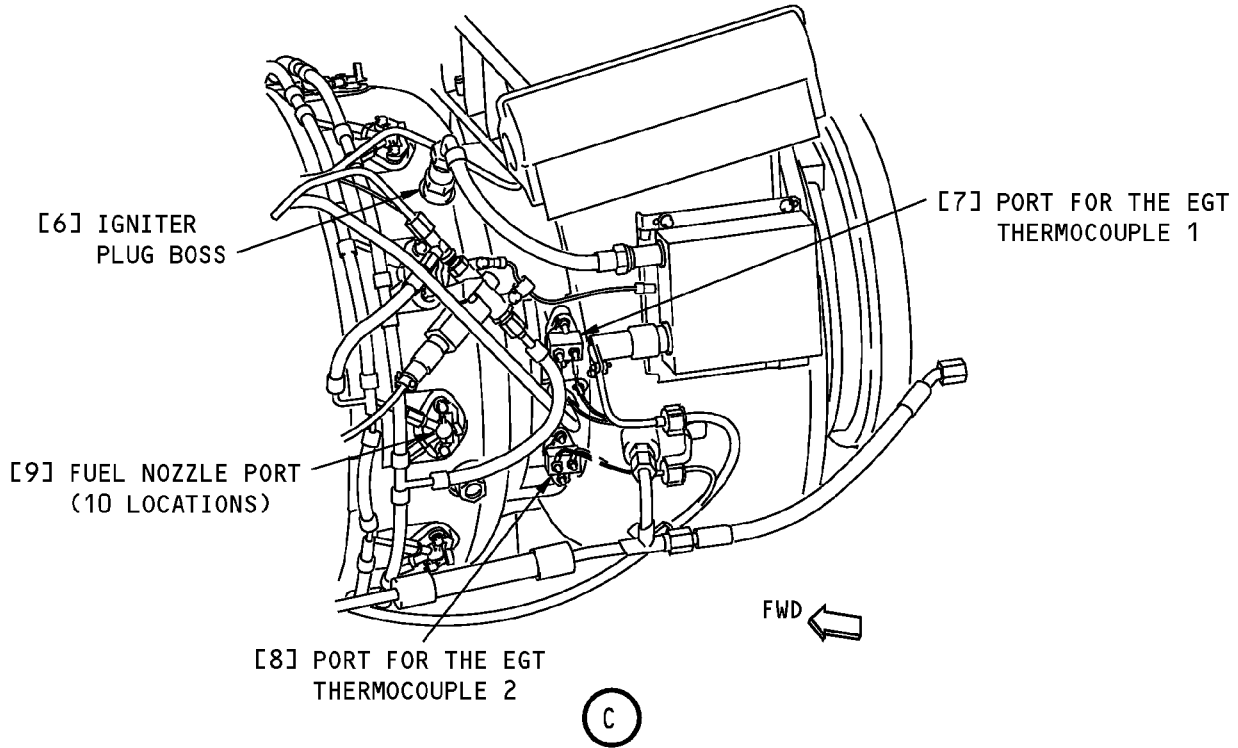
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**APU Engine Inspection**  
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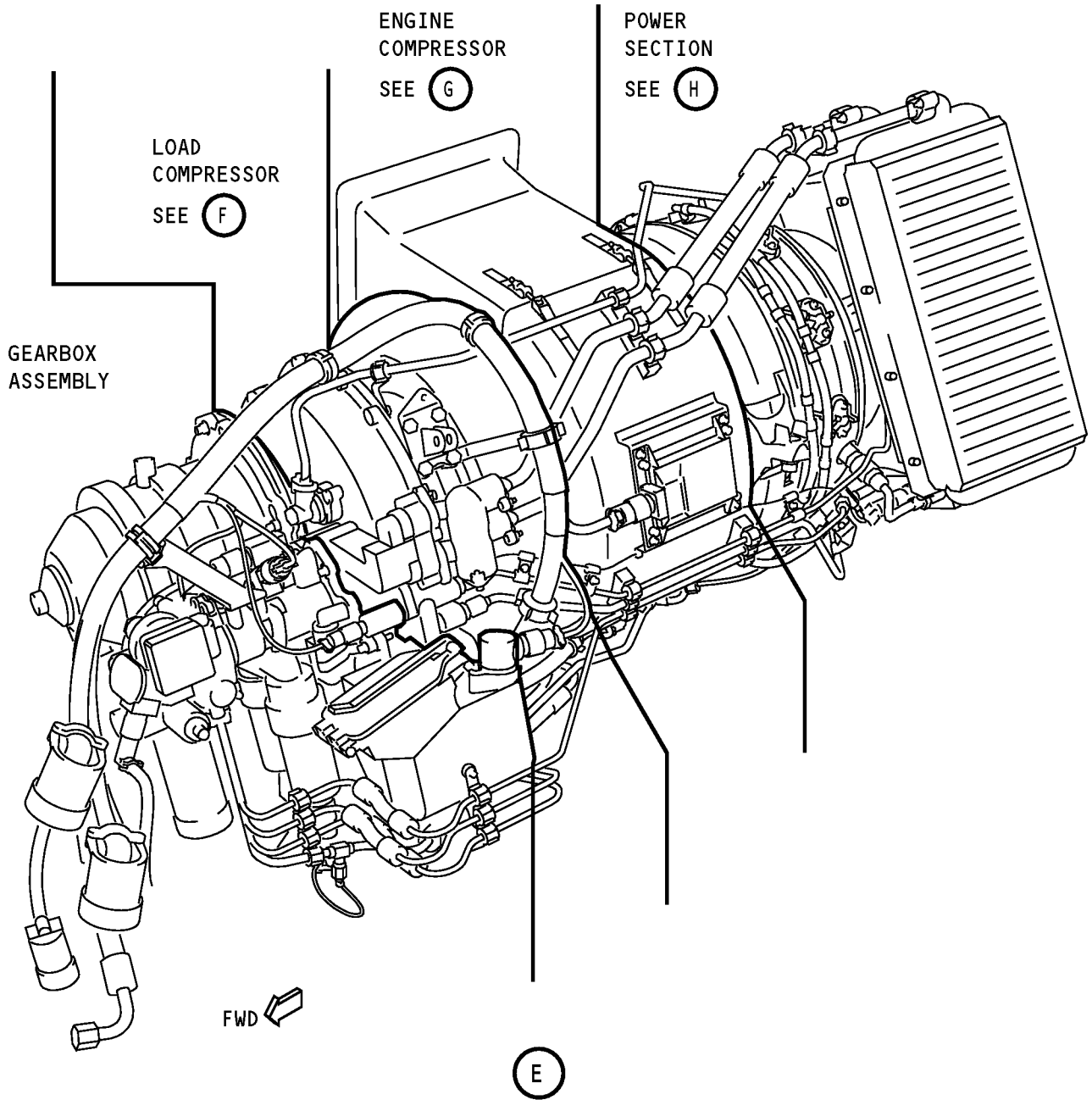
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**APU Engine Inspection**  
**Figure 601 (Sheet 3 of 16)/49-21-00-990-802**

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**APU Engine Inspection**  
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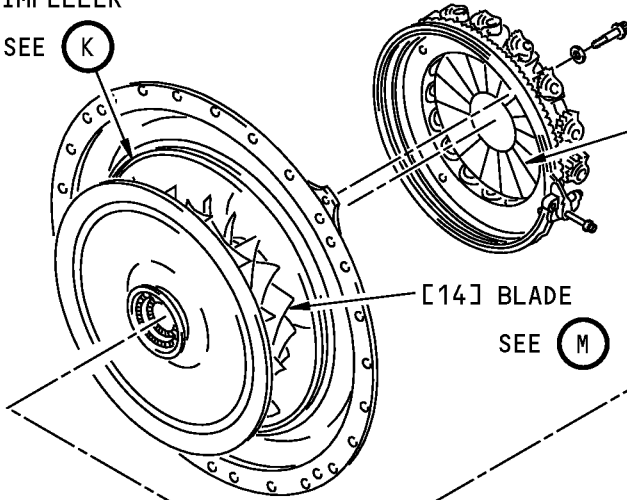
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[13] LOAD COMPRESSOR  
IMPELLER

SEE (K)



[15] INLET GUIDE VANE  
(16 LOCATIONS)

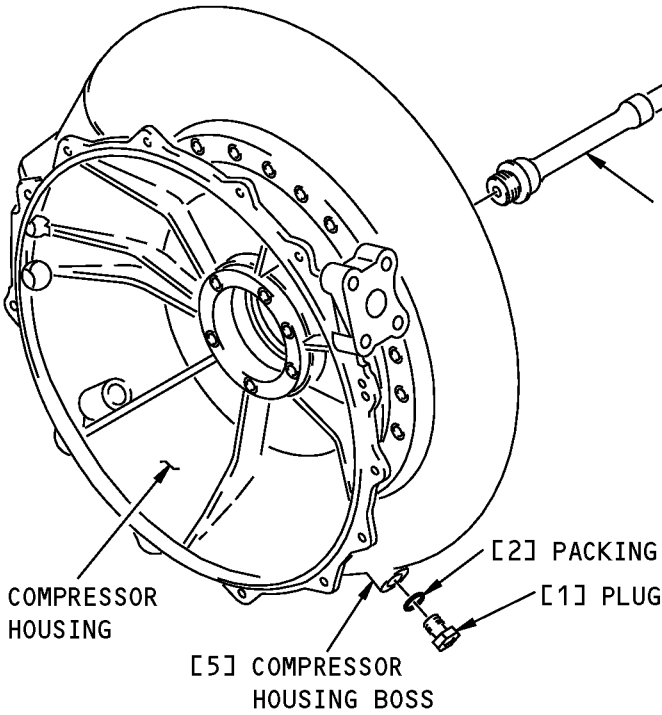
SEE (L)

[14] BLADE  
SEE (M)

[16] LOAD  
COMPRESSOR  
DIFFUSER  
SEE (J)

[17] VANE

TURBINE  
SHAFT



COMPRESSOR  
HOUSING

[2] PACKING

[1] PLUG

[5] COMPRESSOR  
HOUSING BOSS

FWD

(F)

**APU Engine Inspection**  
**Figure 601 (Sheet 5 of 16)/49-21-00-990-802**

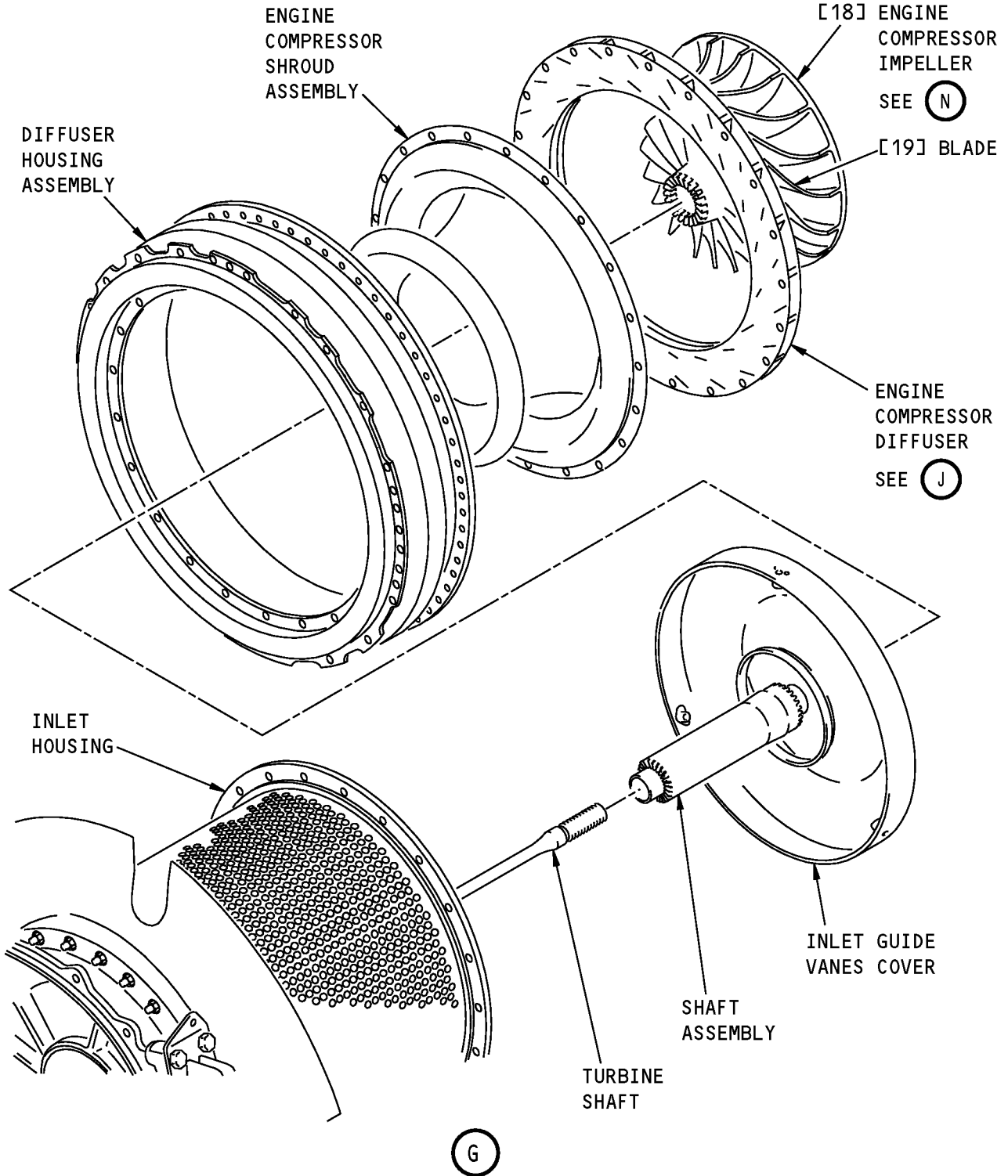
EFFECTIVITY  
HAP ALL

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**APU Engine Inspection**  
**Figure 601 (Sheet 6 of 16)/49-21-00-990-802**

EFFECTIVITY  
HAP ALL

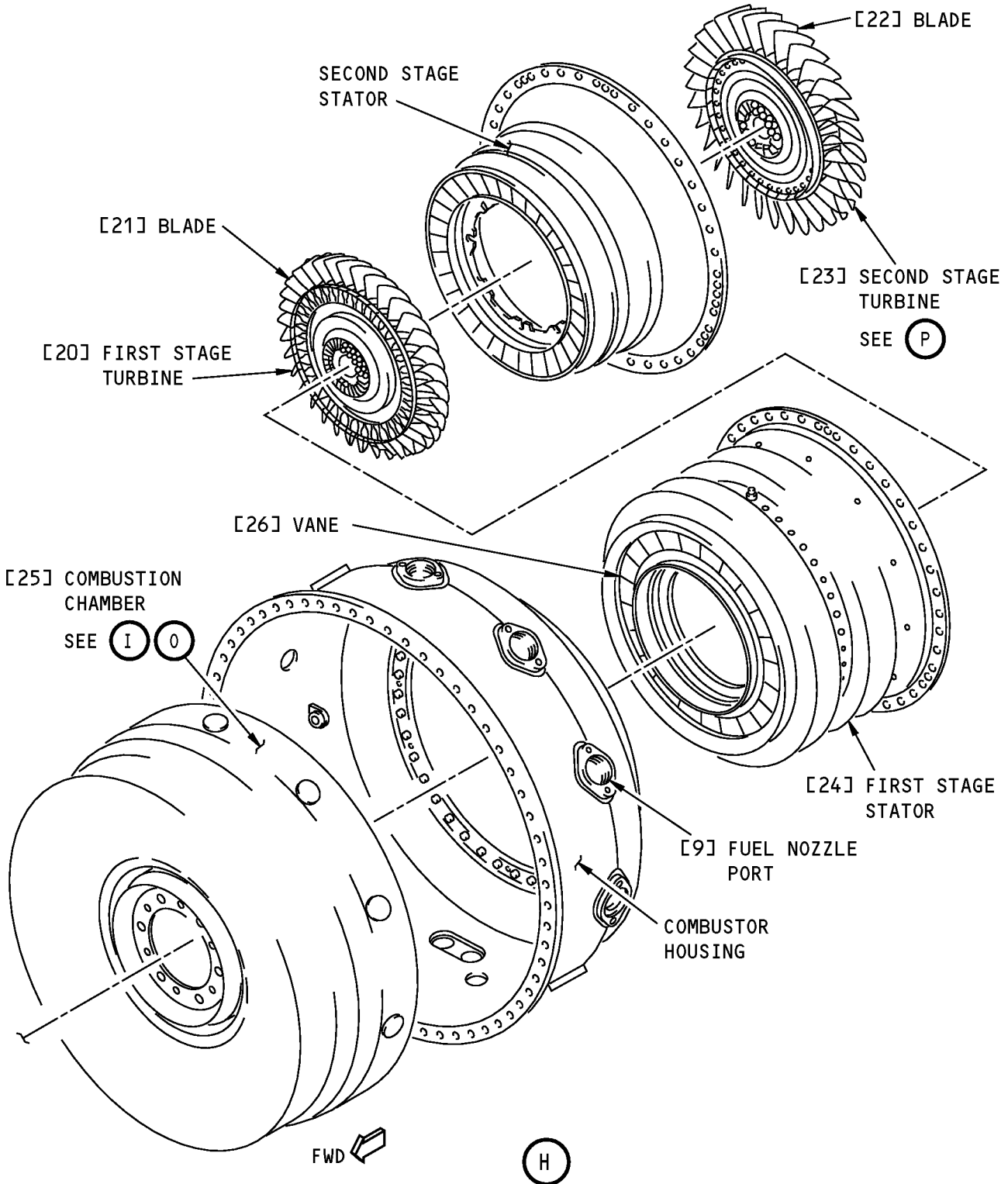
**49-21-00**

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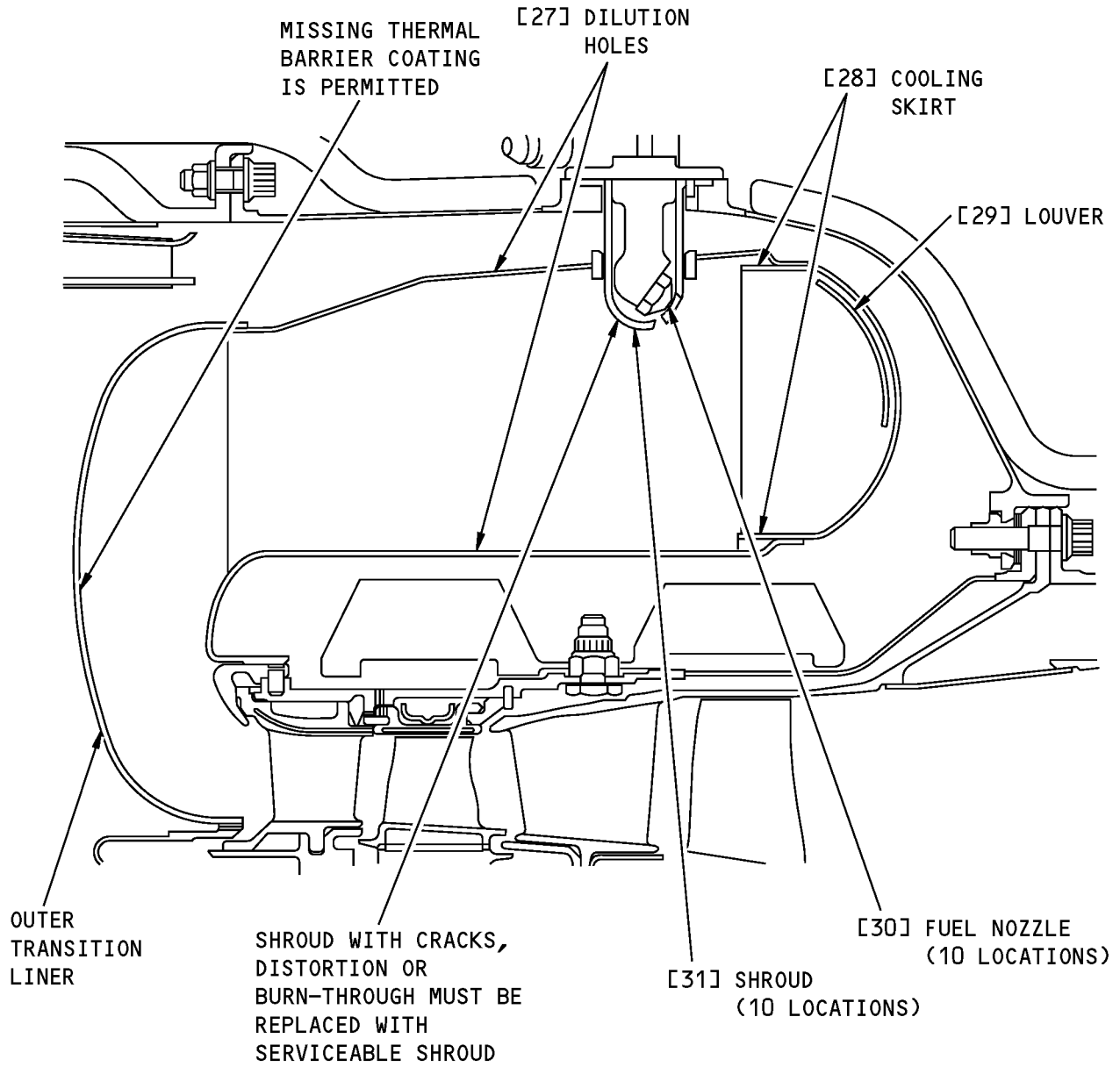
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**Figure 601 (Sheet 7 of 16)/49-21-00-990-802**

EFFECTIVITY  
HAP ALL

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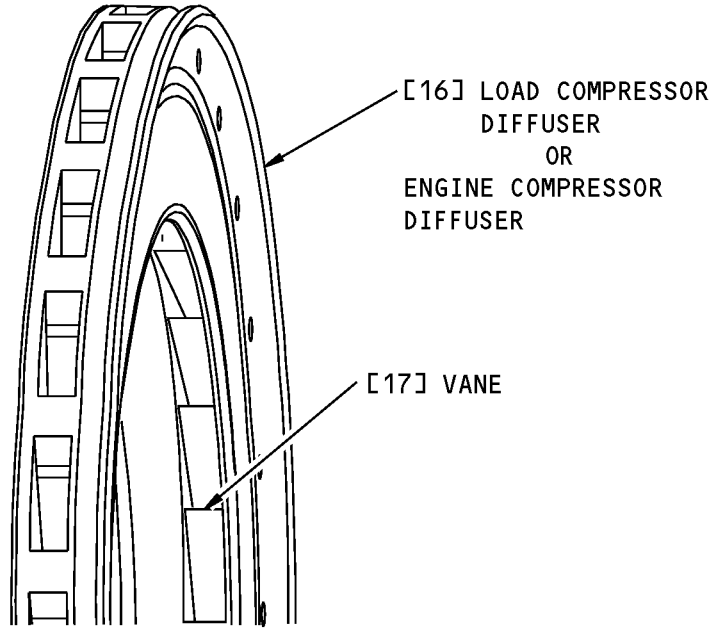
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**APU Engine Inspection**  
**Figure 601 (Sheet 8 of 16)/49-21-00-990-802**

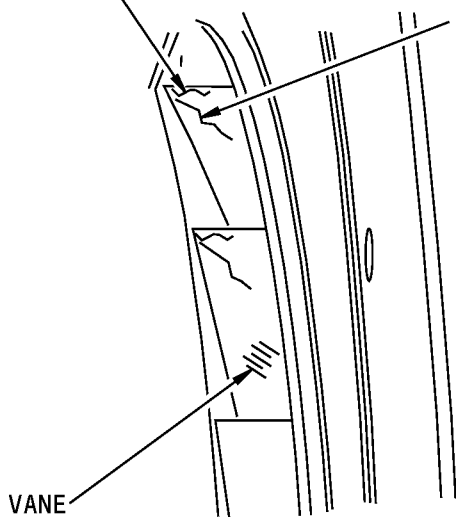
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HAP ALL

**49-21-00**

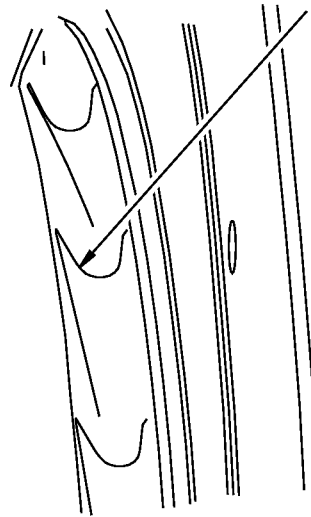
**737-600/700/800/900  
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NICKS AND SMALL EROSION  
EDGE DAMAGE ON THE  
LEADING EDGE ARE  
PERMITTED



CRACKS IN BRAZED  
FILLET AREA AND  
ACROSS THE VANE  
ARE PERMITTED



(PERMITTED LIMITS)

(REJECTED LIMITS)

**LOAD COMPRESSOR DIFFUSER/ENGINE COMPRESSOR DIFFUSER**

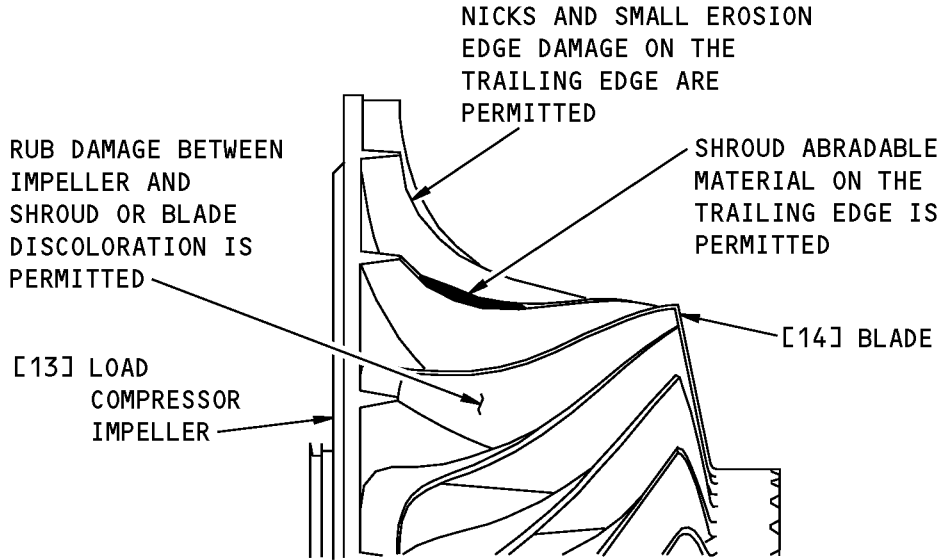
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**APU Engine Inspection  
Figure 601 (Sheet 9 of 16)/49-21-00-990-802**

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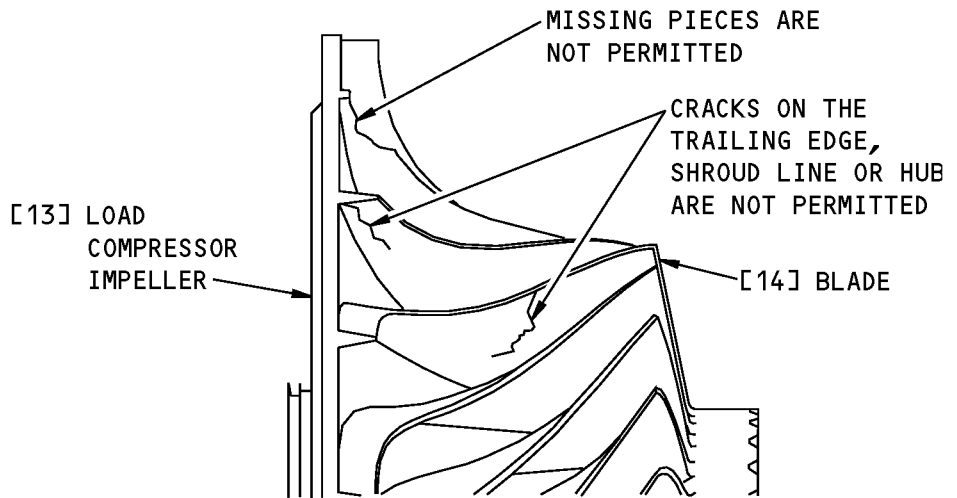
**49-21-00**

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**LOAD COMPRESSOR IMPELLER  
(PERMITTED LIMITS)**

(K)



**LOAD COMPRESSOR IMPELLER  
(REJECTED LIMITS)**

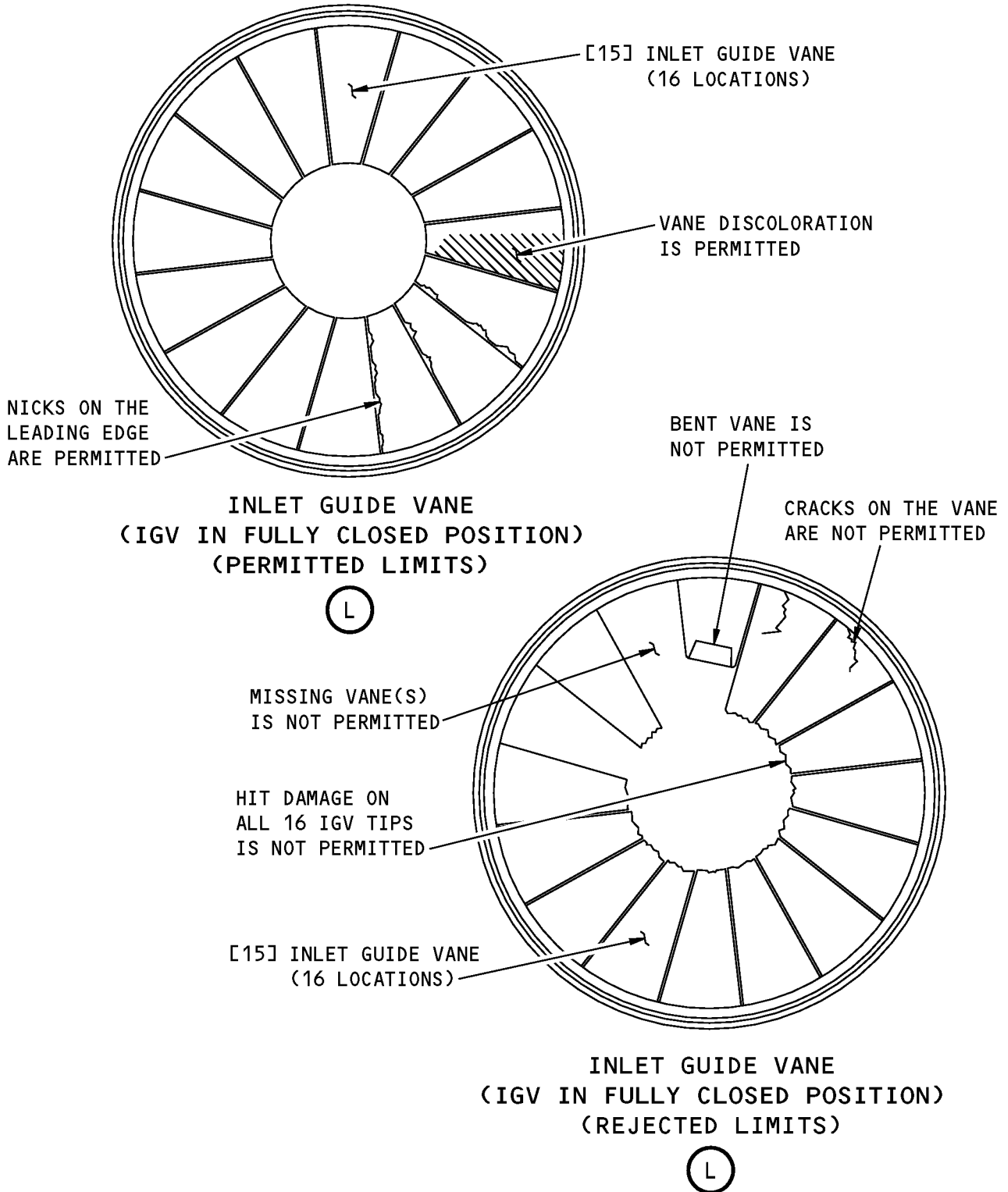
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**APU Engine Inspection  
Figure 601 (Sheet 10 of 16)/49-21-00-990-802**

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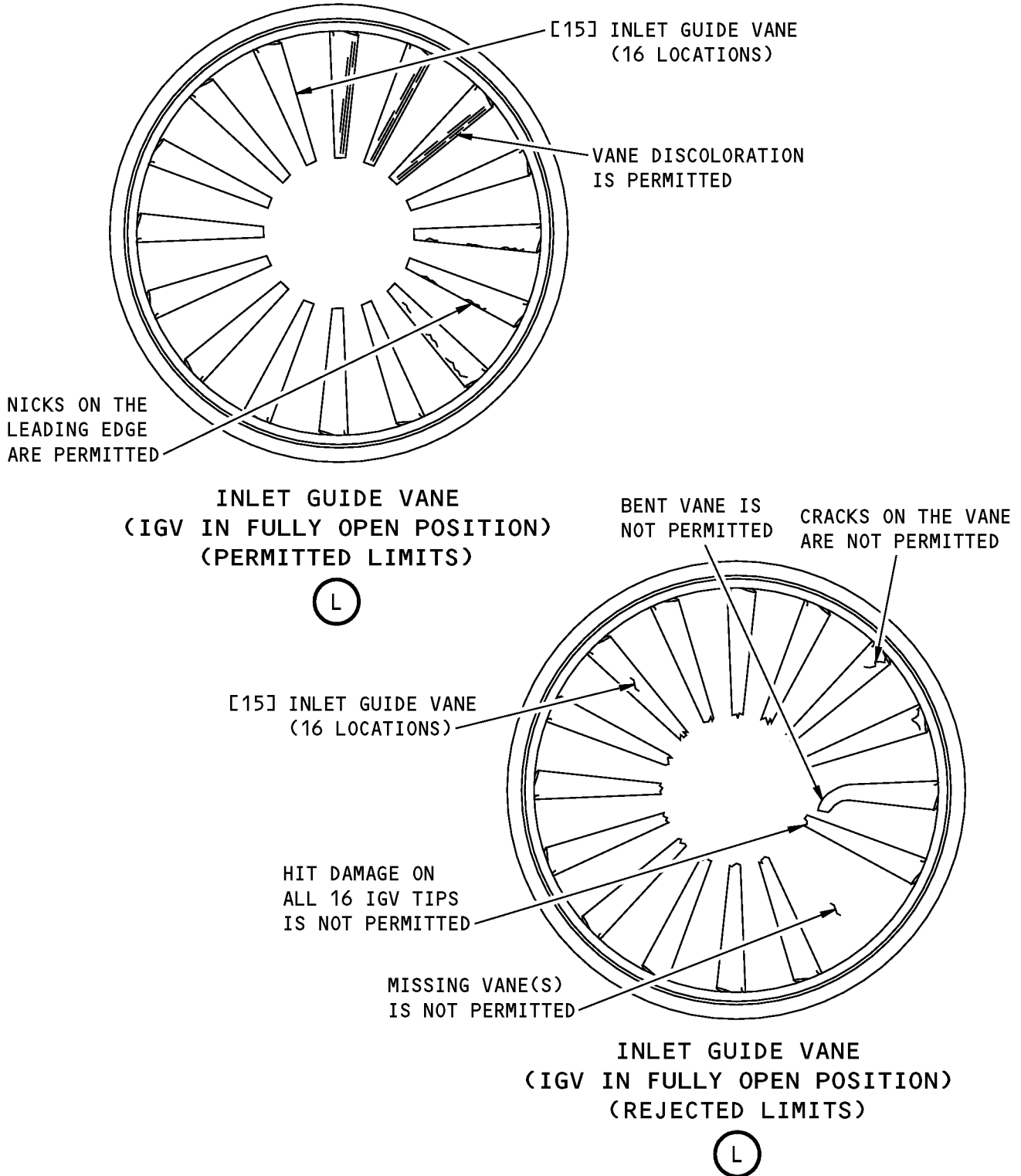
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**Figure 601 (Sheet 11 of 16)/49-21-00-990-802**

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**AIRCRAFT MAINTENANCE MANUAL**

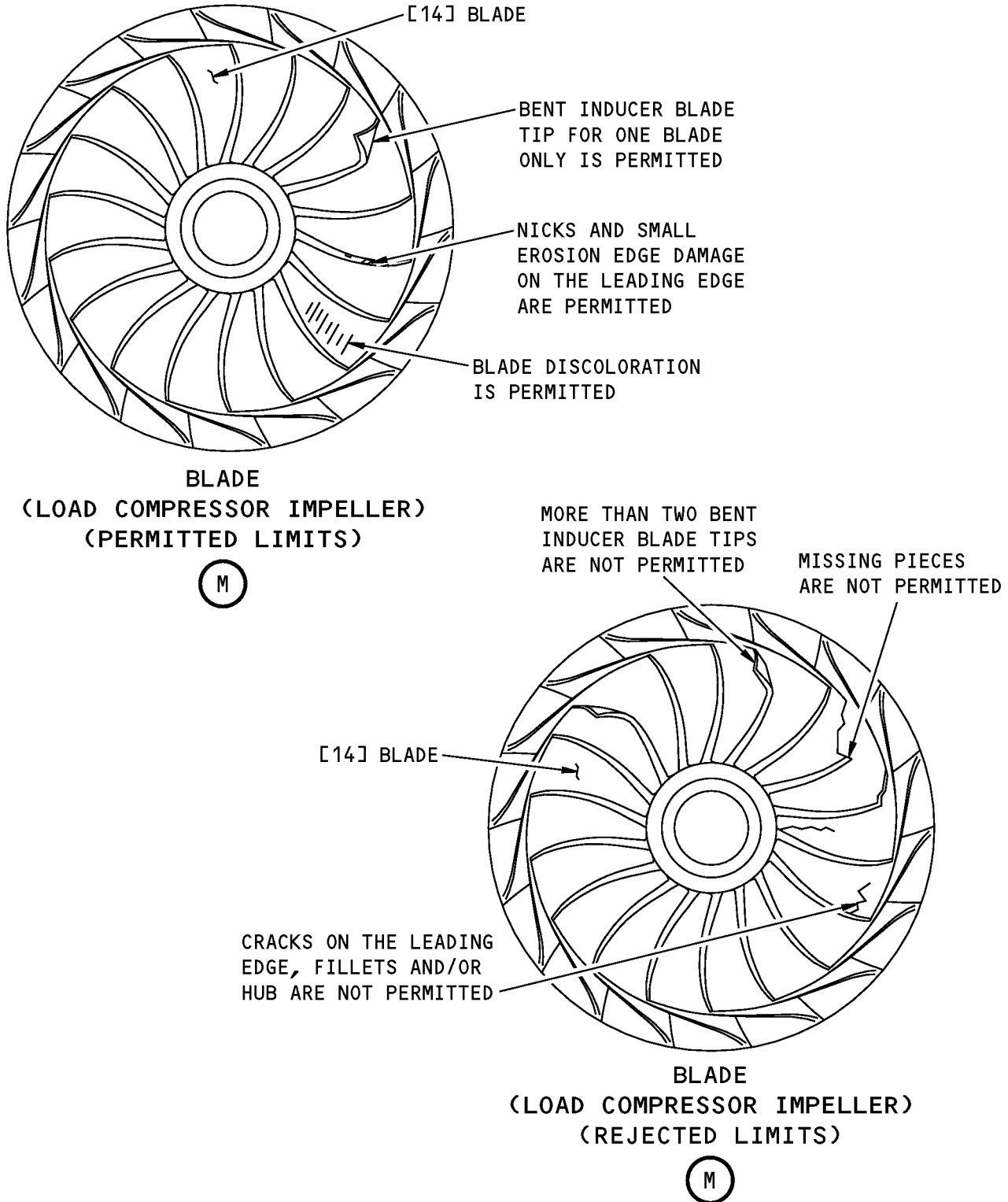


**APU Engine Inspection**  
**Figure 601 (Sheet 12 of 16)/49-21-00-990-802**

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**APU Engine Inspection**  
**Figure 601 (Sheet 13 of 16)/49-21-00-990-802**

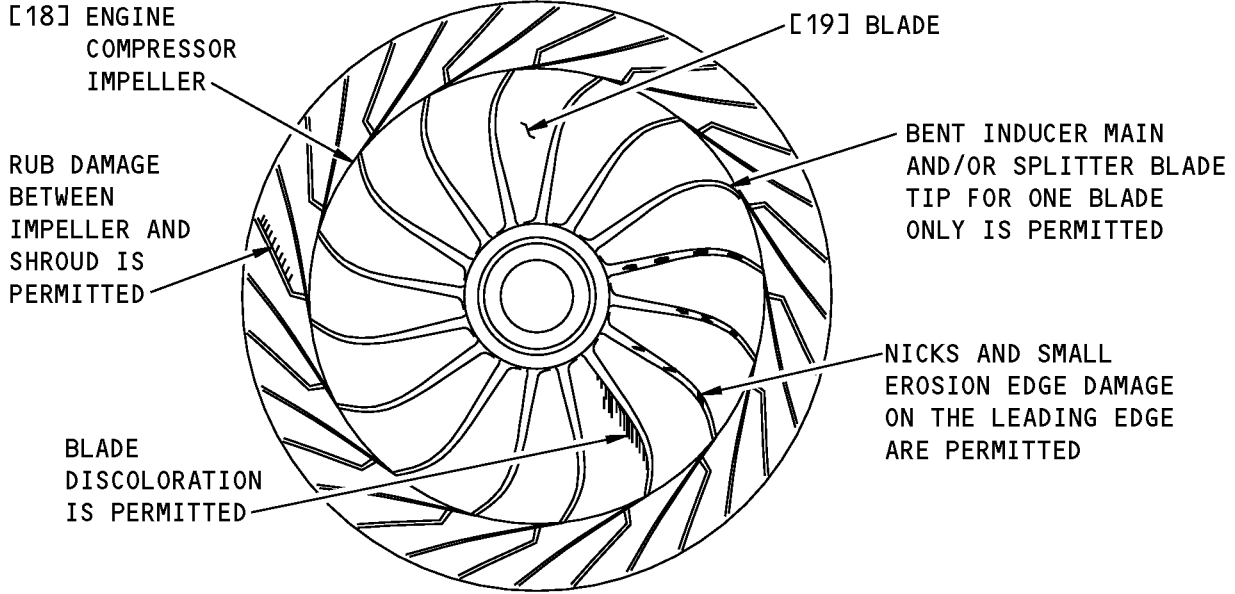
EFFECTIVITY
HAP ALL

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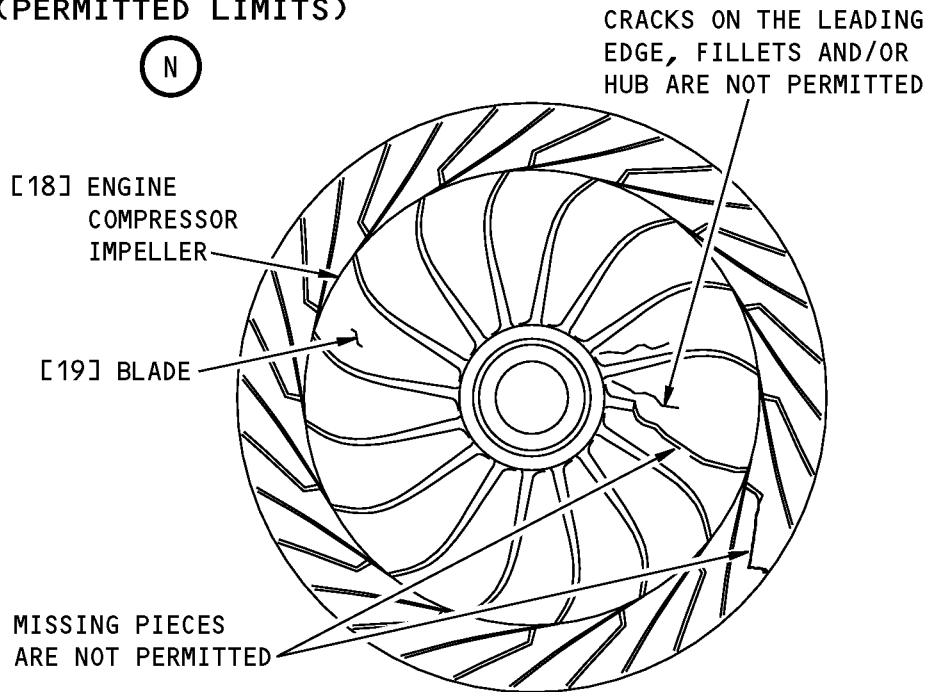
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**ENGINE COMPRESSOR IMPELLER  
(PERMITTED LIMITS)**

(N)



**ENGINE COMPRESSOR IMPELLER  
(REJECTED LIMITS)**

(N)

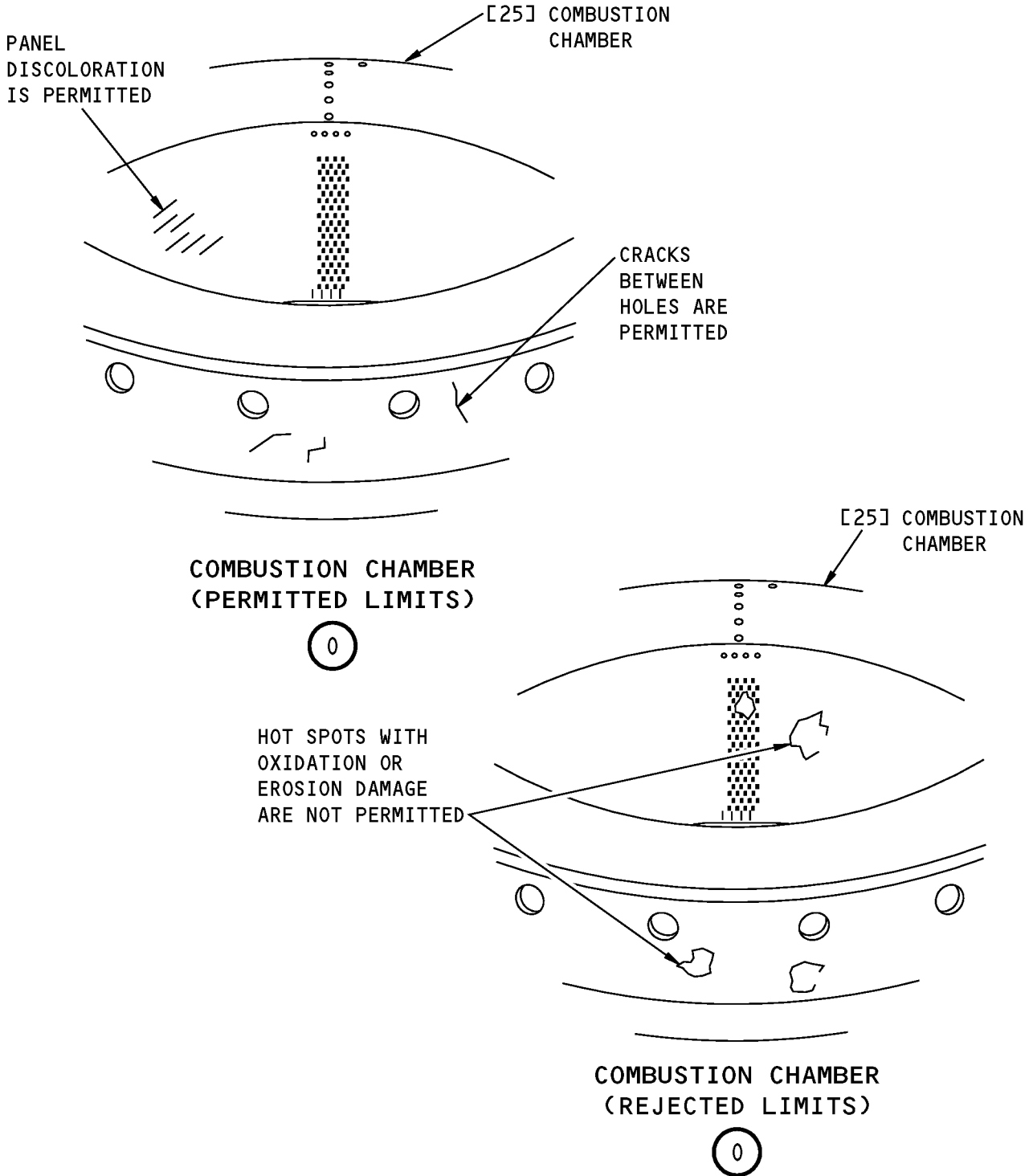
**APU Engine Inspection  
Figure 601 (Sheet 14 of 16)/49-21-00-990-802**

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**AIRCRAFT MAINTENANCE MANUAL**

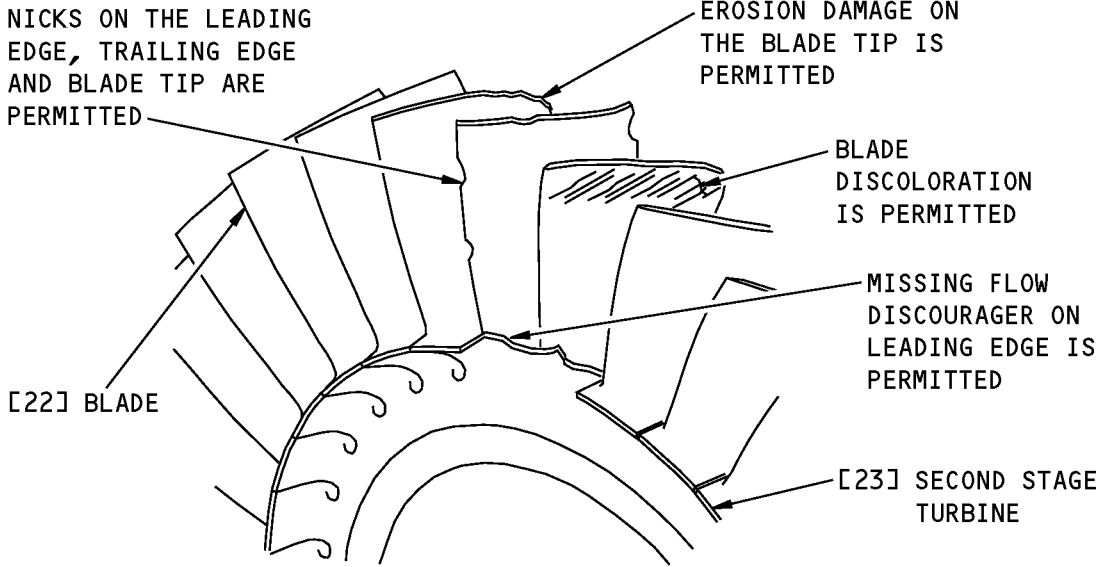


**APU Engine Inspection**  
**Figure 601 (Sheet 15 of 16)/49-21-00-990-802**

EFFECTIVITY
HAP ALL

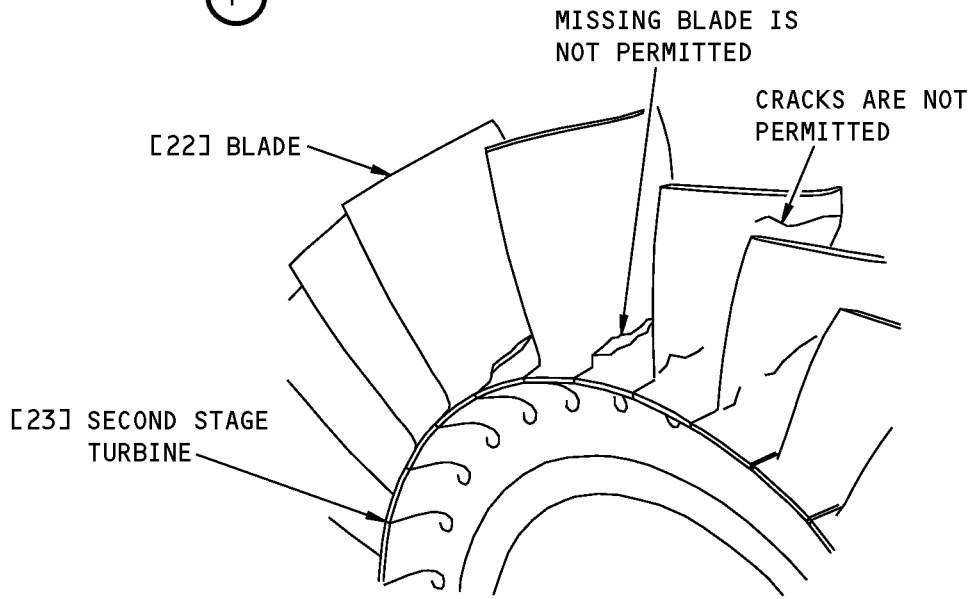
**49-21-00**

**AIRCRAFT MAINTENANCE MANUAL**



**SECOND STAGE TURBINE  
(PERMITTED LIMITS)**

(P)



**SECOND STAGE TURBINE  
(REJECTED LIMITS)**

(P)

**APU Engine Inspection**  
Figure 601 (Sheet 16 of 16)/49-21-00-990-802

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TASK 49-21-00-200-802

3. First Stage Stator and First Stage Turbine Inspection

(Figure 601, Figure 602)

A. References

Reference	Title
49-11-00-000-801	APU Power Plant Removal (P/B 401)
49-11-00-400-801	APU Power Plant Installation (P/B 401)
49-21-00-980-801	Manually Turn the APU Engine (P/B 201)
49-31-14-000-801	Fuel Nozzle Removal (P/B 401)
49-31-14-400-801	Fuel Nozzle Installation (P/B 401)
49-41-51-000-801	Igniter Plug Removal (P/B 401)
49-41-51-400-801	Igniter Plug Installation (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-2609	Tube - Guide (Part #: 2025465-1, Supplier: 06848, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
COM-4316	Borescope - Inspection, Flexible 6 mm (Olympus) (Part #: 7110561, Supplier: 32212, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: IF6C5X1-8, Supplier: 32212, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
COM-4964	Light Source - Borescope (Part #: 7502152, Supplier: 32212, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Prepare for the Inspection

SUBTASK 49-21-00-860-009

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

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# AIRCRAFT MAINTENANCE MANUAL

SUBTASK 49-21-00-860-010

(2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-21-00-010-003

(3) Open this APU cowl door. To open this APU cowl door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU cowl door.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU cowl door.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

## F. Procedure

SUBTASK 49-21-00-940-002

(1) Prepare the 6 mm flexible Olympus borescope, COM-4316 and light source, COM-4964 or equivalent to examine the internal parts of the APU.

SUBTASK 49-21-00-290-008

(2) Examine the vanes ([26], Figure 601) of the first stage stator [24]:

**NOTE:** You can get access to the vanes through the igniter plug boss or through the fuel nozzle port on the combustor housing.

- (a) Do these steps to examine the vanes [26] of the first stage stator through the igniter plug boss [6]:
  - 1) Do this task: Igniter Plug Removal, TASK 49-41-51-000-801.

**CAUTION:** MAKE SURE THAT THE INTERNAL TEMPERATURE OF THE APU IS LESS THAN 176°F (80°C) BEFORE YOU PUT THE BORESCOPE INTO THE APU. DAMAGE TO THE BORESCOPE CAN OCCUR.

- 2) Put the 6 mm flexible Olympus borescope, COM-4316 through the igniter plug boss [6] to get access to the vanes [26].

**NOTE:** You can use a guide tube, COM-2609, to get access to the leading edge of the vanes [26].

- 3) Look at each vane [26] for these inspections:
  - a) Through wall holes in the leading edge are not permitted (Figure 602).

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- b) Missing vane(s) is not permitted.
  - c) Unwanted material between the vane passages are not permitted.
  - d) Missing pieces at the leading edge are not permitted.
  - e) Missing pieces at the trailing edge that extend into the cooling discharge passages are not permitted.
  - f) Cracks on the leading edge and trailing edge are permitted.
  - g) Missing pieces at the trailing edge that do not touch the cooling discharge passages are permitted.
  - h) Nicks are permitted.
- 4) Replace the APU if you found damage that were not permitted. These are the tasks:
- APU Power Plant Removal, TASK 49-11-00-000-801,
  - APU Power Plant Installation, TASK 49-11-00-400-801.
- 5) Slowly remove the 6 mm flexible Olympus borescope, COM-4316, from the igniter plug boss ([6], Figure 601).
- 6) If the guide tube, COM-2609, was used during the borescope inspection, remove the guide tube from the igniter plug boss [6].
- 7) Do this task: Igniter Plug Installation, TASK 49-41-51-400-801.
- (b) Do these steps to examine the vanes ([26], Figure 601) of the first stage stator through the fuel nozzle port [9] on the combustor housing:

**NOTE:** You can remove more than one fuel nozzle to get access to the vanes. Obey the number of fuel nozzles that you can remove at the same time.

- 1) Do this task: Fuel Nozzle Removal, TASK 49-31-14-000-801.

**CAUTION:** MAKE SURE THAT THE INTERNAL TEMPERATURE OF THE APU IS LESS THAN 176°F (80°C) BEFORE YOU PUT THE BORESCOPE INTO THE APU. DAMAGE TO THE BORESCOPE CAN OCCUR.

- 2) Put the 6 mm flexible Olympus borescope, COM-4316, through the fuel nozzle port [9] to get access to the vanes [26].
- 3) Look at each vane [26] for these inspections:
- a) Through wall holes in the leading edge are not permitted (Figure 602).
  - b) Missing vane(s) is not permitted.
  - c) Unwanted materials between the vane passages are not permitted.
  - d) Missing pieces at the leading edge are not permitted.
  - e) Missing pieces at the trailing edge that extend into the cooling discharge passages are not permitted.
  - f) Cracks on the leading edge and trailing edge are permitted.
  - g) Missing pieces at the trailing edge that do not touch the cooling discharge passages are permitted.
  - h) Nicks are permitted.
- 4) Replace the APU if you found damage that were not permitted. These are the tasks:
- APU Power Plant Removal, TASK 49-11-00-000-801,
  - APU Power Plant Installation, TASK 49-11-00-400-801.

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- 5) Slowly remove the 6 mm flexible Olympus borescope, COM-4316, from the fuel nozzle port ([9], Figure 601).
- 6) Do this task: Fuel Nozzle Installation, TASK 49-31-14-400-801.

SUBTASK 49-21-00-290-009

- (3) Examine the blades ([21], Figure 601) of the first stage turbine [20]:

**NOTE:** You can get access to the blades through the igniter plug boss or through the fuel nozzle port on the combustor housing.

- (a) Do this task: Manually Turn the APU Engine, TASK 49-21-00-980-801.
- (b) Do these steps to examine the blades [21] of the first stage turbine [20] through the igniter plug boss [6]:
  - 1) Do this task: Igniter Plug Removal, TASK 49-41-51-000-801.

**CAUTION:** MAKE SURE THAT THE INTERNAL TEMPERATURE OF THE APU IS LESS THAN 176°F (80°C) BEFORE YOU PUT THE BORESCOPE INTO THE APU. DAMAGE TO THE BORESCOPE CAN OCCUR.

- 2) Put the 6 mm flexible Olympus borescope, COM-4316 through the igniter plug boss [6] to get access to the blades [21].

**NOTE:** You can use a guide tube, COM-2609, to get access to the leading edge of the blades [21].

**CAUTION:** MAKE SURE THAT THE FORWARD END OF THE BORESCOPE IS CLEAR OF THE BLADES OF THE FIRST STAGE TURBINE. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE APU.

- 3) Look at each blade [21] for these inspections:
  - a) Cracks are not permitted (Figure 602).
  - b) Missing pieces are not permitted.
  - c) Nicks on the leading edge, trailing edge or blade tip are permitted.
  - d) Blade discoloration is permitted.
  - e) Erosion wear on the blade tip is permitted.
  - f) Missing flow discouragers on the leading or the trailing edge are permitted.
- 4) Replace the APU if you found damage that were not permitted. These are the tasks:
  - APU Power Plant Removal, TASK 49-11-00-000-801,
  - APU Power Plant Installation, TASK 49-11-00-400-801.
- 5) Slowly remove the 6 mm flexible Olympus borescope, COM-4316, from the igniter plug boss ([6], Figure 601).
- 6) If the guide tube, COM-2609, was used during the borescope inspection, remove the guide tube from the igniter plug boss [6].
- 7) Do this task: Igniter Plug Installation, TASK 49-41-51-400-801.
- (c) Do these steps to examine the blades ([21], Figure 601) of the first stage turbine through the fuel nozzle port [9] on the combustor housing:

**NOTE:** You can remove more than one fuel nozzle to get access to the blades. Obey the number of fuel nozzles that you can remove at the same time.

- 1) Do this task: Fuel Nozzle Removal, TASK 49-31-14-000-801.

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CAUTION: MAKE SURE THAT THE INTERNAL TEMPERATURE OF THE APU IS LESS THAN 176°F (80°C) BEFORE YOU PUT THE BORESCOPE INTO THE APU. DAMAGE TO THE BORESCOPE CAN OCCUR.

- 2) Put the 6 mm flexible Olympus borescope, COM-4316, through the fuel nozzle port [9] to get access to the blades [21].

CAUTION: MAKE SURE THAT THE FORWARD END OF THE BORESCOPE IS CLEAR OF THE BLADES OF THE FIRST STAGE TURBINE. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE APU.

- 3) Look at each blade [21] for these inspections:
a) Cracks are not permitted (Figure 602).
b) Missing pieces are not permitted.
c) Nicks on the leading edge, trailing edge or blade tip are permitted.
d) Blade discoloration is permitted.
e) Erosion wear on the blade tip is permitted.
f) Missing flow discouragers on the leading or the trailing edge are permitted.
4) Replace the APU if you found damage that were not permitted. These are the tasks:
• APU Power Plant Removal, TASK 49-11-00-000-801,
• APU Power Plant Installation, TASK 49-11-00-400-801.
5) Slowly remove the 6 mm flexible Olympus borescope, COM-4316, from the fuel nozzle port ([9], Figure 601).
6) Do this task: Fuel Nozzle Installation, TASK 49-31-14-400-801.
(d) If it is not necessary to manually turn the APU engine for other inspection tasks, complete the procedure to manually turn the APU engine. To complete it, do this task: Manually Turn the APU Engine, TASK 49-21-00-980-801.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-21-00-860-011

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Table with 4 columns: Row, Col, Number, Name. Row B, Col 19, Number C01344, Name APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Table with 4 columns: Row, Col, Number, Name. Row A, Col 14, Number C00033, Name AUX POWER UNIT CONT

SUBTASK 49-21-00-860-012

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-21-00-410-003

- (3) Close this APU cowl door. To close this APU cowl door, do these steps:

Table with 2 columns: Number, Name/Location. Row 315A, Name/Location APU Cowl Door

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- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU cowl door.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU cowl door.
- (g) Close the three latches.

————— **END OF TASK** —————

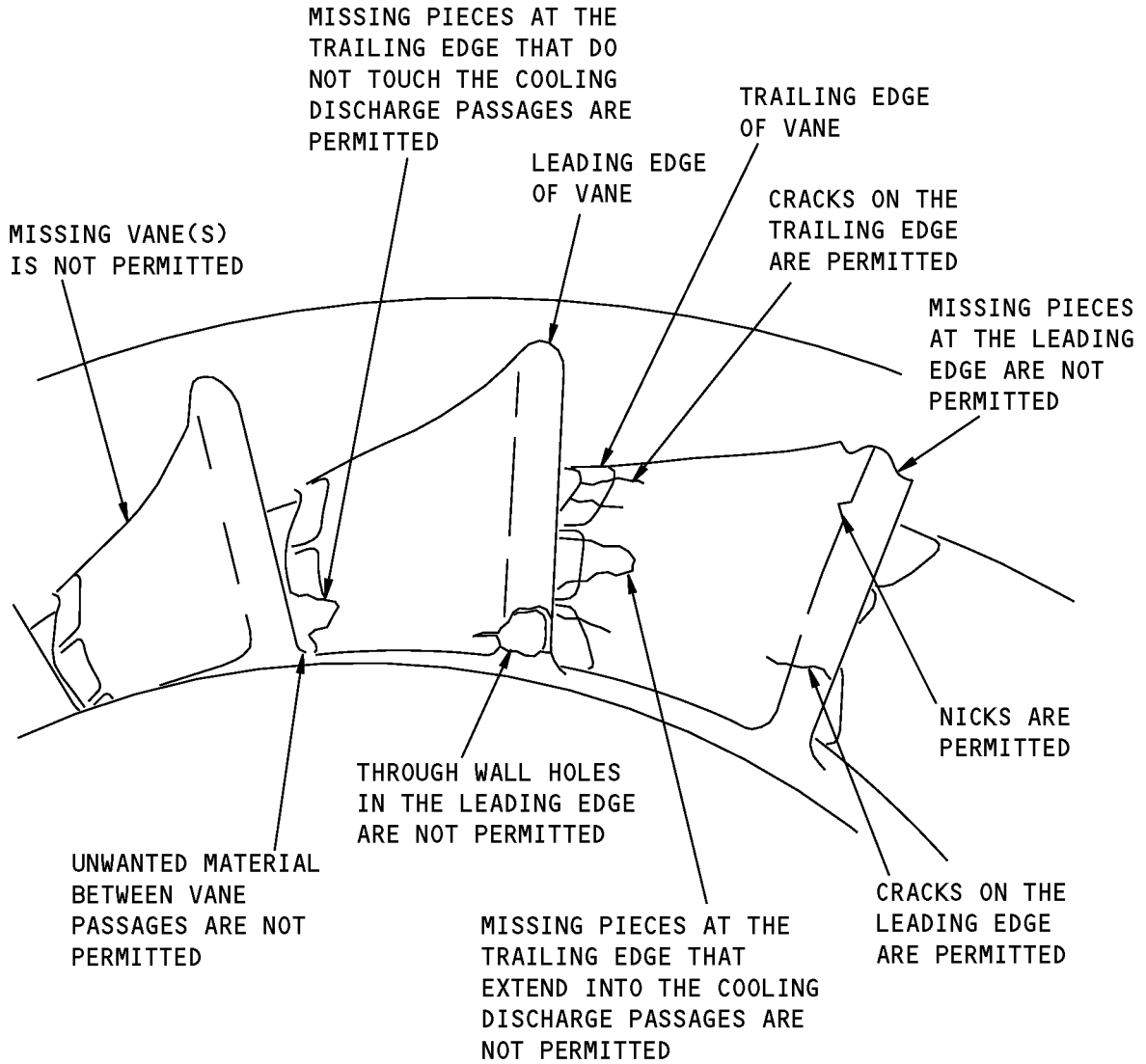
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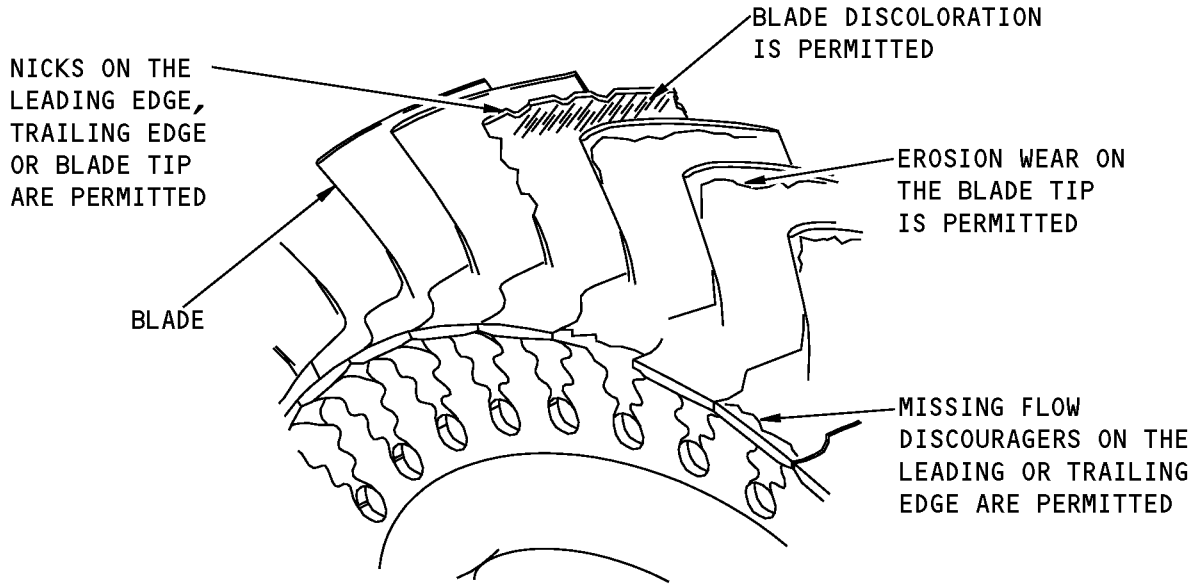
**FIRST STAGE STATOR**

**First Stage Stator and First Stage Turbine Inspection  
Figure 602 (Sheet 1 of 2)/49-21-00-990-803**

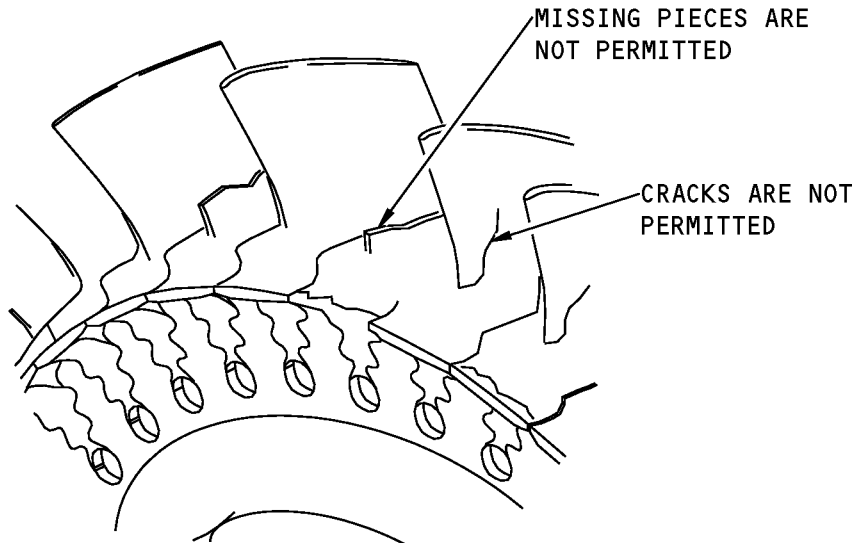
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**FIRST STAGE TURBINE  
(PERMITTED LIMITS)**



**FIRST STAGE TURBINE  
(REJECTED LIMITS)**

**First Stage Stator and First Stage Turbine Inspection  
Figure 602 (Sheet 2 of 2)/49-21-00-990-803**

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# AIRCRAFT MAINTENANCE MANUAL

## APU ENGINE - CLEANING/PAINTING

### 1. General

- A. This procedure has the task to clean the power and load compressor sections of the APU engine.
- B. The APU engine must be shutdown for a minimum of sixty (60) minutes before you can do the APU engine compressor cleaning procedure. The sixty (60) minutes are necessary to make sure the APU engine is sufficiently cool and for maximum performance of the cleaning solution.

### **TASK 49-21-00-200-803**

### 2. APU Engine Compressor Cleaning

#### A. References

Reference	Title
24-22-00-860-813	Supply External Power (P/B 201)
24-22-00-860-814	Remove External Power (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-52-13-000-801	Bleed Air Duct Removal (P/B 401)
49-52-13-400-801	Bleed Air Duct Installation (P/B 401)

#### B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-3862	Cart - Compressor Washer (Part #: 08-4048-1012, Supplier: 59603, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: 08-4049-1012, Supplier: 59603, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Opt Part #: 08-4048-1011, Supplier: 59603, A/P Effectivity: 737-300, -400, -500)
STD-1054	Container - Fuel Resistant, 5 Gallon (19 Liters)
STD-1056	Container - Solvent Resistant, 5 Gallon (19 Liters)

#### C. Consumable Materials

Reference	Description	Specification
B50032	Compound - Gas Turbine Compressor Cleaner, Water Based, ZOKmx	
B50033	Compound - Cleaning, Turbine Engine Gas Path (aqueous, no hydrocarbons, for on-line cleaning)	MIL-PR~ F-85704, Type III
G02418	Water - De-ionized	
G50228	Tape - 3M Y436 Aluminum Foil Sound Damping Tape	

#### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

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## AIRCRAFT MAINTENANCE MANUAL

### E. Prepare for the Cleaning Procedure

SUBTASK 49-21-00-860-013

- (1) Make sure sixty (60) minutes have gone by since the last APU start.

**NOTE:** The sixty (60) minutes are necessary to make sure the APU engine is sufficiently cool and for maximum performance of the cleaning solution.

SUBTASK 49-21-00-860-014

- (2) Make sure the APU BLEED switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-21-00-020-001

- (3) Remove the bleed air duct. To remove it, do this task: Bleed Air Duct Removal, TASK 49-52-13-000-801.

SUBTASK 49-21-00-860-015

- (4) Make sure there is a protection cover on the bleed duct assembly.

**NOTE:** No protection cover is necessary on the bleed air valve.

SUBTASK 49-21-00-490-001

- (5) Install a locally-fabricated flexible duct with a clamp on the bleed air valve to change the direction of the steam (cleaning solution or de-ionized water) from the 1088 bulkhead to the ground.

SUBTASK 49-21-00-020-002

- (6) Disconnect the electrical connector P10 from the bleed air valve and install the protection covers on the electrical connector and bleed air valve.

SUBTASK 49-21-00-210-001

- (7) Look at the two indications on the position switch for the bleed air valve.

**NOTE:** There are two indications on the position switch to show the position of the bleed air valve. You can find the OPEN and CLOSED indications on the top of the bleed air valve.

- (a) Make sure the indication for the bleed air valve shows CLOSED.

SUBTASK 49-21-00-950-001

- (8) Install the 3M Y436 Tape, G50228 over the plenum drain hole (location on the right side above the forward end of the APU cowl door).

SUBTASK 49-21-00-110-001

- (9) Do these steps to prepare the cleaning solution and compressor washer cart, COM-3862 or equivalent compressor washer equipment:

- (a) Prepare approximately three gallons (11.4 liters) of cleaning solution with the ZOKmx compound, B50032 (concentrated) or compound, B50033 per the manufacturer's instructions.

**NOTE:** The cleaning solution comes in a ready-to-use container or a concentrated compound container.

**NOTE:** It is recommended that de-ionized water, G02418 must be used if water is a component of the cleaning solution.

**NOTE:** The manufacturer's instructions for the ZOKmx compound, B50032 (concentrated) is one part of compound to four parts of de-ionized water, G02418.

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- (b) Put the cleaning solution in the compressor washer cart, COM-3862 or equivalent compressor washer equipment.

**NOTE:** The compressor washer equipment must have a wand assembly and supply approximately three gallons (11.4 liters) of cleaning solution at a flow rate of approximately 1 to 1.5 gallons per minute (3.8 to 5.7 liters per minute).

**WARNING:** MAKE SURE YOU WEAR PROTECTIVE SPLASH GOGGLES OR FACE SHIELD, EAR PROTECTION, GLOVES AND OTHER PERSONNEL PROTECTION EQUIPMENT WHEN YOU USE THE COMPRESSOR WASHER EQUIPMENT AND CLEANING SOLUTION. INJURY TO PERSONS CAN OCCUR.

- (c) Use the compressor washer cart, COM-3862 to put the cleaning solution as a spray into the opening of the air inlet door.
- (d) Make sure you have an empty solvent resistant container (5 gal)(19 Liters), STD-1056 and approximately two gallons (7.6 liters) of de-ionized water, G02418 with the compressor washer cart, COM-3862.

#### F. APU Engine Compressor Cleaning

SUBTASK 49-21-00-110-002

- (1) Do these steps to do the APU engine cold-wash procedure:

- (a) Put the 5 gallon (19 liters) fuel resistant container, STD-1054 below the APU drain seal.

**WARNING:** DO NOT TOUCH THE IGNITION COMPONENTS UNTIL YOU DO THESE STEPS. THESE STEPS WILL RELEASE THE HIGH VOLTAGE FROM THE IGNITION UNIT. IF YOU DO NOT OBEY THIS PROCEDURE, INJURY TO PERSONS CAN OCCUR.

- (b) Do these steps to release the high voltage from the ignition unit:
  - 1) Make sure five minutes have gone by since the last APU start.
  - 2) Disconnect the electrical connector P13 from the ignition unit.
  - 3) Make sure you install all necessary protection covers.
- (c) Do these steps to disconnect the fuel supply tube from the fuel flow divider:
  - 1) Disconnect the electrical connector P23 from the flow divider solenoid and install the protection covers on the electrical connector and flow divider solenoid.
  - 2) Put the 5 gallon (19 liters) fuel resistant container, STD-1054 below the fuel flow divider to drain the fuel from the fitting.
  - 3) Disconnect the fitting for the fuel supply tube from the fuel flow divider and install a cap on the fitting.
- (d) Do this task: Supply External Power, TASK 24-22-00-860-813.
- (e) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

- (f) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

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(g) Make sure the BAT switch on the P5 forward overhead panel is ON.

**WARNING:** DO NOT OPERATE ANY FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. FUEL VAPORS IN THE TANK MAY IGNITE AND CAUSE A FIRE OR EXPLOSION.

(h) Set the No. 1 AFT FUEL PUMP switch or No. 1 FWD FUEL PUMP switch to the ON position.

**NOTE:** If you must use the fuel boost pumps in the center tank, you must have a maintenance person or observer in the flight compartment to continuously monitor the LOW PRESSURE lights. You must set the applicable fuel boost pump to the OFF position if the LOW PRESSURE light for the center tank stays on.

**WARNING:** MAKE SURE THAT YOU DO NOT STAND IN FRONT OF THE AIR INLET DOOR AREA OR HAVE ANY LOOSE OBJECTS THAT CAN GO INTO THE AIR INLET PLENUM DURING THE APU OPERATION. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(i) Get access to the side of the air inlet door area from the outside of the airplane with the compressor washer cart, COM-3862, solvent resistant container (5 gal)(19 Liters), STD-1056 and approximately two gallons (7.6 liters) of de-ionized water, G02418.

**NOTE:** It is recommended that you use three persons to do the APU engine compressor cleaning. The location of the first person is on the side of the air inlet door area and outside of the airplane. The location of the second person is in the flight compartment to motor the APU and for the APU starting procedure. The location of the third person is at the APU compartment and to help the first person when to start the spray of the cleaning solution.

(j) Do these steps to motor the APU engine and to apply the cleaning solution into the opening of the air inlet door:

- 1) Set the APU master switch to the ON position.
- 2) Make sure the air inlet door opens in approximately 30 seconds.
- 3) Put the wand assembly in the opening of the air inlet door and make sure the cleaning solution spray will go in the APU inlet duct.
  - a) Make sure you install the wand assembly as far into the opening of the air inlet door as possible to get the maximum amount of cleaning solution into the APU inlet duct.
- 4) Set the APU master switch to the START position and release it to the ON position.
- 5) When you hear the APU engine start to rotate, use the compressor washer cart, COM-3862 to apply the cleaning solution into the APU inlet duct until the APU engine has a protective shutdown.
- 6) Motor the APU engine until the APU has a protective shutdown.

**NOTE:** The APU engine will have a protective shutdown between 17-20 seconds.

- 7) Make sure a fuel fog comes out of the exhaust duct muffler during the APU engine motor operation.
- 8) Remove the wand assembly from the opening of the air inlet door.
- 9) Set the APU master switch to the OFF position.

**NOTE:** The air inlet door closes in approximately 30 seconds.

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- 10) If it is necessary to motor the APU engine and to apply more cleaning solution again, it is recommended that you obey the start duty cycle.

NOTE: The start duty cycle for the APU is three times in a 15 minute interval. If you do three successful or unsuccessful start cycles in a 15 minute interval, it is recommended that you wait 15 minutes after the third start cycle for the power electronics to cool. This 15 minute interval is necessary to cool the temperature of the power electronics in the start power unit and/or start converter unit. If the duty cycle is exceeded and the temperature limit is reached, the APU will not start.

- (k) After you motor the APU engine, let the cleaning solution soak on the internal parts of the power and load compressor sections for 15-30 minutes.
(l) Install a DO-NOT-OPERATE tag on the APU master switch.
(m) Set the No. 1 AFT FUEL PUMP switch or No. 1 FWD FUEL PUMP switch to the OFF position.
(n) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Table with 4 columns: Row, Col, Number, Name. Row B, Col 19, Number C01344, Name APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Table with 4 columns: Row, Col, Number, Name. Row A, Col 14, Number C00033, Name AUX POWER UNIT CONT

- (o) Remove the 5 gallon (19 liters) fuel resistant container, STD-1054.
(p) Remove the protection covers and connect the electrical connector P13 to the ignition unit.
(q) Remove the protection covers and cap and connect the fitting for the fuel supply tube to the fuel flow divider.
1) Tighten the fitting to 140 in-lb (15.8 N-m).
(r) Remove the protection covers and connect the electrical connector P23 to the flow divider solenoid.
(s) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Table with 4 columns: Row, Col, Number, Name. Row B, Col 19, Number C01344, Name APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Table with 4 columns: Row, Col, Number, Name. Row A, Col 14, Number C00033, Name AUX POWER UNIT CONT

- (t) Remove the DO-NOT-OPERATE tag from the APU master switch.

SUBTASK 49-21-00-110-003

- (2) Do these steps to do the APU engine hot-wash procedure:
(a) Make sure you have a minimum of two gallons (7.6 liters) of cleaning solution in the compressor washer cart, COM-3862.
(b) Make sure 15-30 minutes have gone by since you completed the APU engine cold-wash procedure.
(c) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

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- (d) During the APU starting and operation, put the wand assembly in the opening of the air inlet door and use the compressor washer cart, COM-3862 to apply the cleaning solution into the APU inlet duct until the compressor washer cart, COM-3862 is empty (no remaining cleaning solution).
(e) Remove the wand assembly from the opening of the air inlet door.
(f) Do these steps to prepare the compressor washer cart, COM-3862 and replace the cleaning solution with de-ionized water, G02418:
1) Remove the remaining cleaning solution from the compressor washer cart, COM-3862 and put it in the solvent resistant container (5 gal)(19 Liters), STD-1056.
2) Put the approximately two gallons (7.6 liters) of de-ionized water, G02418 in the compressor washer cart, COM-3862.
(g) During the APU operation, put the wand assembly in the opening of the air inlet door and use the compressor washer cart, COM-3862 to apply the de-ionized water, G02418 into the APU inlet duct until the compressor washer cart, COM-3862 is empty (no remaining de-ionized water, G02418).
(h) Remove the wand assembly from the opening of the air inlet door.
(i) Remove the compressor washer cart, COM-3862, solvent resistant container (5 gal)(19 Liters), STD-1056 and other equipment from the air inlet door area.
(j) Operate the APU for a minimum of 15 minutes after the rinse cycle to dry the APU engine.
(k) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-21-00-860-016

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Table with 4 columns: Row, Col, Number, Name. Row B, Col 19, Number C01344, Name APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Table with 4 columns: Row, Col, Number, Name. Row A, Col 14, Number C00033, Name AUX POWER UNIT CONT

SUBTASK 49-21-00-090-001

- (2) Remove the clamp and locally-fabricated flexible duct from the bleed air valve.

SUBTASK 49-21-00-420-002

- (3) Remove the protection covers and connect the electrical connector P10 to the bleed air valve.

SUBTASK 49-21-00-420-003

- (4) Install the bleed air duct. To install it, do this task: Bleed Air Duct Installation, TASK 49-52-13-400-801.

SUBTASK 49-21-00-860-019

- (5) Remove the 3M Y436 Tape, G50228 from the plenum drain hole.

SUBTASK 49-21-00-860-017

- (6) Remove the DO-NOT-OPERATE tag from the APU BLEED switch on the P5 forward overhead panel.

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SUBTASK 49-21-00-860-018

(7) Do this task: Remove External Power, TASK 24-22-00-860-814.

————— **END OF TASK** —————

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# AIRCRAFT MAINTENANCE MANUAL

## APU FUEL SYSTEM - MAINTENANCE PRACTICES

### 1. General

A. This procedure has these tasks:

- (1) Fuel Leakage Check
- (2) APU Fuel Supply Flow Check.

B. The fuel leakage check makes sure the APU fuel system is not damaged.

C. The flow check for the APU fuel supply makes sure the correct quantity of fuel is supplied to the APU.

### **TASK 49-31-00-700-801**

### 2. Fuel Leakage Check

(Figure 201)

A. References

Reference	Title
24-22-00-860-813	Supply External Power (P/B 201)
24-22-00-860-814	Remove External Power (P/B 201)

B. Tools/Equipment

**NOTE:** When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1973	Equipment - Test, Fuel Feed, Auxiliary Power Unit (Part #: C49011-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

C. Consumable Materials

Reference	Description	Specification
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Prepare for the Fuel Leakage Check

SUBTASK 49-31-00-860-005

- (1) Make sure the APU master switch [3] on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

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SUBTASK 49-31-00-860-014

(2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-00-010-003

(3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

**G. Procedure**

SUBTASK 49-31-00-780-001

(1) Do the fuel leakage check:

**NOTE:** If you must use the fuel boost pumps in the center tank, you must have a maintenance person or observer in the flight compartment to continuously monitor the LOW PRESSURE lights. Turn the applicable fuel boost pump to the OFF position if the LOW PRESSURE light for the center tank stays on.

- (a) Make sure the CTR L FUEL PUMP switch [1], No. 1 FWD FUEL PUMP switch [4] and No. 1 AFT FUEL PUMP switch [5] are in the OFF position.
- (b) Make sure the CROSS FEED valve switch [2] is in the CLOSED position.
- (c) Put the 1 gallon (4 l) fuel resistant container, STD-4049 under the fuel supply tube [7].

**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (d) Disconnect the fuel supply tube [7] from the fitting [6] on the 1088 bulkhead.
- (e) Drain the fuel from the fuel supply tube [7] into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (f) Install the equipment, SPL-1973 [9] to the fitting [6] and fuel supply tube [7].

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- (g) Make sure the valve handle [8] is in the OFF position.
- (h) Supply external electrical power to the airplane. To supply it, do this task: Supply External Power, TASK 24-22-00-860-813
- (i) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

- (j) Set the No. 1 AFT FUEL PUMP switch [5] or No. 1 FWD FUEL PUMP switch [4] to the ON position.
- (k) Remove the DO-NOT-OPERATE tag from the APU master switch [3].
- (l) Set the APU master switch [3] to the ON position.

**NOTE:** Do not set the APU master switch to the START position. It is not necessary to start the APU for this fuel leakage check.

- (m) Make sure the fuel pressure gage shows 18-26 psig (124-179 kPa).
- (n) Set the No. 1 AFT FUEL PUMP switch [5] or No. 1 FWD FUEL PUMP switch [4] to the OFF position.
- (o) Set the APU master switch [3] to the OFF position and install a DO-NOT-OPERATE tag.
- (p) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

- (q) Make sure the manual override handle on the APU fuel shutoff valve is in the CLOSED position.

**NOTE:** The APU fuel shutoff valve is on the rear spar of the left wing in the wheel well. The manual override handle on the APU fuel shutoff valve gives an OPEN or CLOSED indication of the shutoff valve position.

- (r) Do these steps to monitor the fuel pressure to make sure there are no leaks in the APU fuel system:

- 1) Make sure the fuel pressure gage shows 15-26 psig (103-179 kPa) for five minutes.
- 2) If the fuel pressure gage shows less than 15 psig (103 kPa), correct all leaks or damage to the APU fuel system.

**NOTE:** A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted during an APU operation from the forward drain on the APU drain seal.

- 3) If the fuel pressure gage shows 15-26 psig (103-179 kPa), the APU fuel system is satisfactory.

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- (s) Set the valve handle [8] to the ON position to bleed the fuel pressure and to drain the fuel into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (t) Remove external electrical power from the airplane, if it is not necessary. To remove it, do this task: Remove External Power, TASK 24-22-00-860-814
- (u) Disconnect the equipment, SPL-1973 [9] from the fitting [6] and fuel supply tube [7].
- (v) Apply a thin layer of aircraft turbine engine oil, D50055 on the threads of the fitting [6].
- (w) Connect the fuel supply tube [7] to the fitting [6] on the 1088 bulkhead.
- (x) Remove the 1 gallon (4 l) fuel resistant container, STD-4049 and equipment, SPL-1973.

#### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-00-010-004

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

SUBTASK 49-31-00-860-016

(2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-00-860-008

(3) Remove the DO-NOT-OPERATE tag from the APU master switch.

————— **END OF TASK** —————

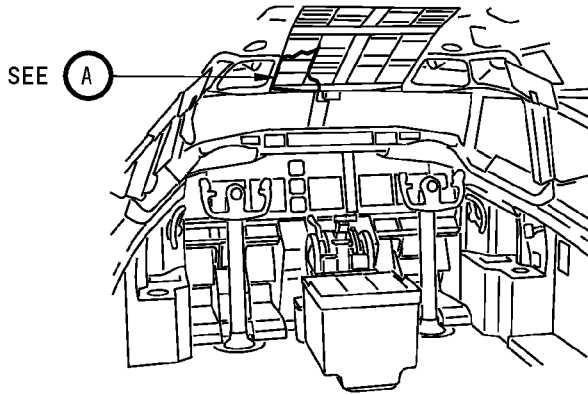
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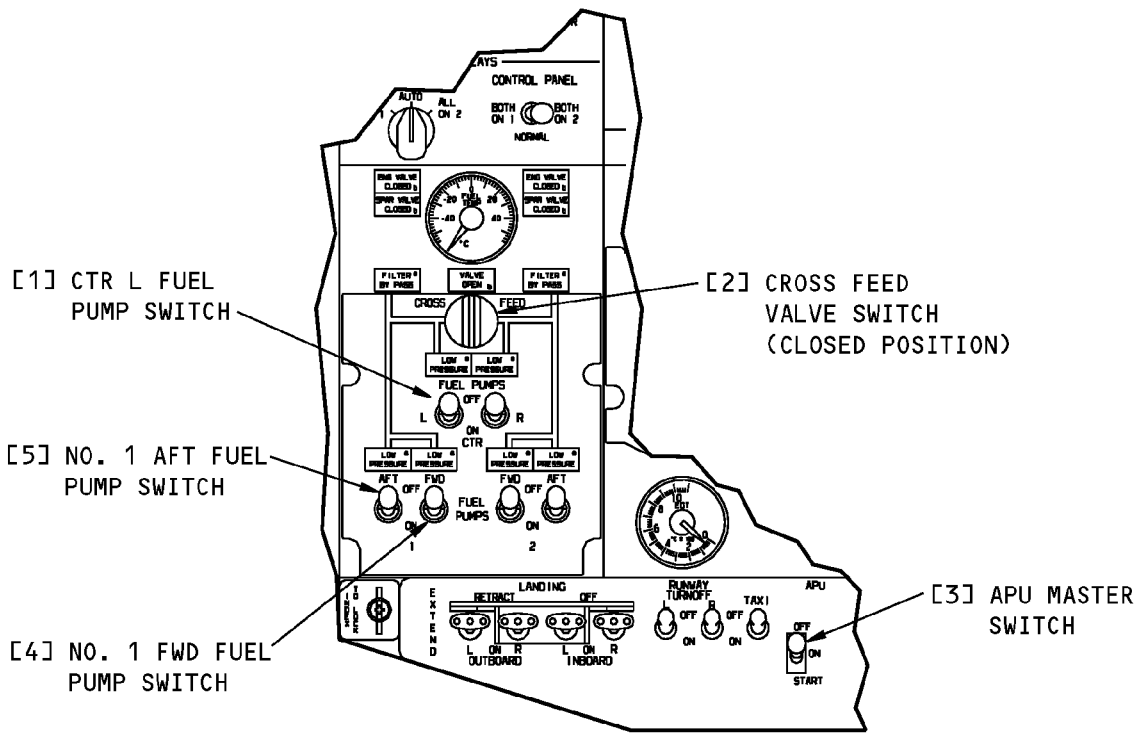
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**FLIGHT COMPARTMENT**



**FORWARD OVERHEAD PANEL, P5**



**APU Fuel System Checks  
Figure 201 (Sheet 1 of 2)/49-31-00-990-801**

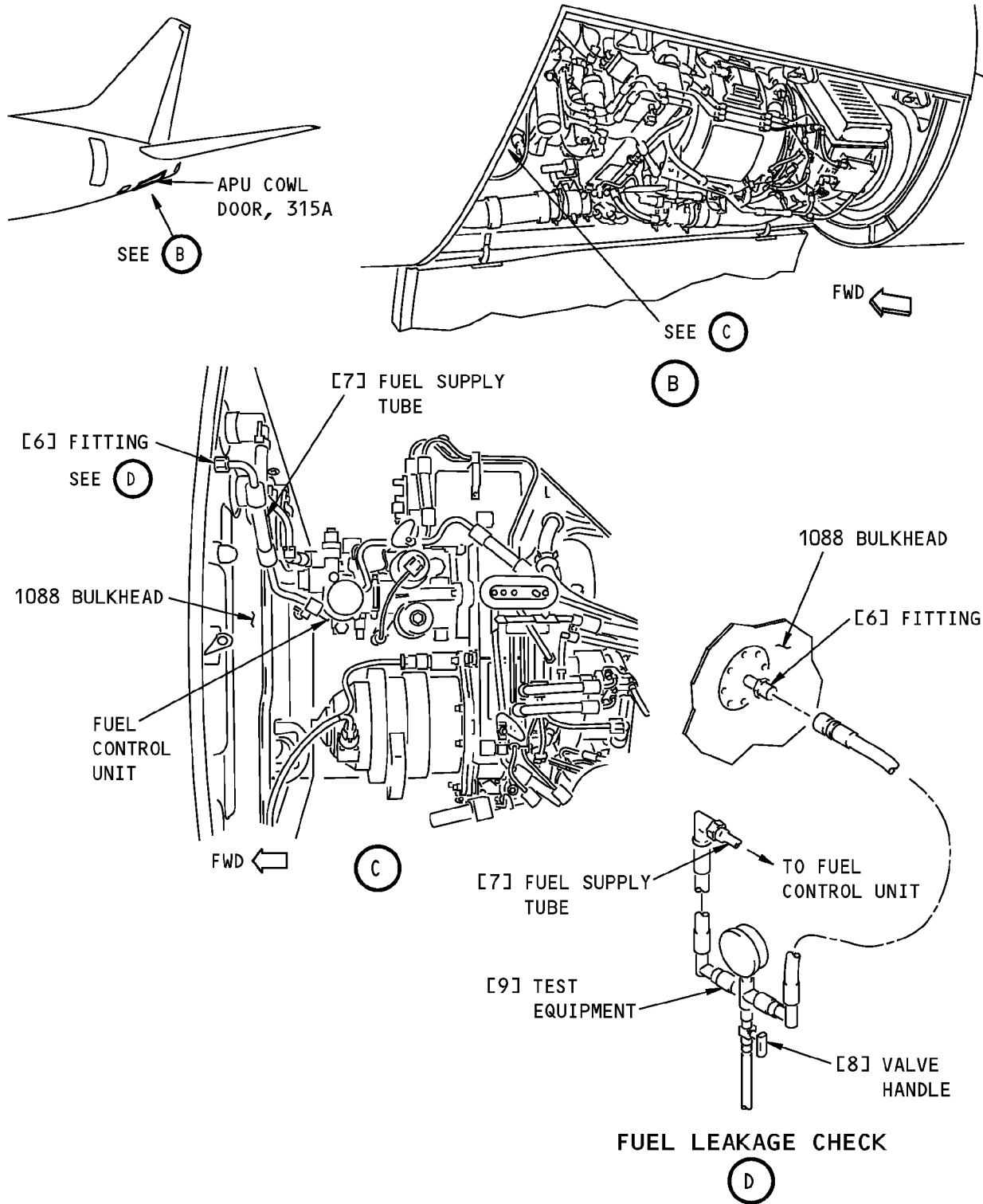
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**APU Fuel System Checks  
Figure 201 (Sheet 2 of 2)/49-31-00-990-801**

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#### TASK 49-31-00-700-802

### 3. APU Fuel Supply Flow Check

(Figure 201)

#### A. References

Reference	Title
24-22-00-860-813	Supply External Power (P/B 201)
24-22-00-860-814	Remove External Power (P/B 201)
28	FUEL

#### B. Tools/Equipment

Reference	Description
STD-200	Container - Fuel Resistant, 10 gallon (38 l)

#### C. Consumable Materials

Reference	Description	Specification
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

#### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### F. Prepare for the Flow Check

SUBTASK 49-31-00-860-009

- (1) Make sure the APU master switch [3] on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-31-00-860-019

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-00-010-005

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

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- (a) Open the three latches.
(b) Open the APU Cowl Door, 315A.
(c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
(d) Remove the retainer pin from the spring clip on the aft hold-open rod.
(e) Disconnect the two hold-open rods from the two spring clips.
(f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
(g) Install the two retainer pins in the two rod ends.

G. Procedure

SUBTASK 49-31-00-720-001

- (1) Do the flow check for the APU fuel supply:

NOTE: If you must use the fuel boost pumps in the center tank, you must have a maintenance person or observer in the flight compartment to continuously monitor the LOW PRESSURE lights. Turn the applicable fuel boost pump to the OFF position if the LOW PRESSURE light for the center tank stays on.

- (a) Make sure the CTR L FUEL PUMP switch [1], No. 1 FWD FUEL PUMP switch [4] and No. 1 AFT FUEL PUMP switch [5] are in the OFF position.
(b) Make sure the CROSS FEED valve switch [2] is in the CLOSED position.
(c) Put the 10 gallon (38 l) fuel resistant container, STD-200 under the fuel supply tube [7].

WARNING: DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (d) Disconnect the fuel supply tube [7] from the fitting [6] on the 1088 bulkhead.
(e) Drain the fuel from the fuel supply tube [7] into the 10 gallon (38 l) fuel resistant container, STD-200.
(f) Install a plug on the fuel supply tube [7].
(g) Connect a fuel hose to the fitting [6] on the 1088 bulkhead.
(h) Put the other end of the fuel hose in the 10 gallon (38 l) fuel resistant container, STD-200.
(i) Supply external electrical power to the airplane. To supply it, do this task: Supply External Power, TASK 24-22-00-860-813
(j) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Table with 4 columns: Row, Col, Number, Name. Row B, Col 19, Number C01344, Name APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Table with 4 columns: Row, Col, Number, Name. Row A, Col 14, Number C00033, Name AUX POWER UNIT CONT

- (k) Set the No. 1 AFT FUEL PUMP switch [5] or No. 1 FWD FUEL PUMP switch [4] to the ON position.

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(l) Remove the DO-NOT-OPERATE tag from the APU master switch [3].

**CAUTION:** WHEN YOU SET THE APU MASTER SWITCH TO THE ON POSITION, FUEL AND AIR WILL START TO FLOW INTO THE CONTAINER. THE FUEL FLOW CAN BE MORE THAN THREE GALLONS FOR EACH MINUTE (11.4 LITERS FOR EACH MINUTE). BE CAREFUL THAT YOU DO NOT SPILL FUEL FROM THE CONTAINER. DAMAGE TO EQUIPMENT CAN OCCUR.

(m) Set the APU master switch [3] to the ON position.

**NOTE:** Do not set the APU master switch to the START position. It is not necessary to start the APU for this fuel flow check.

(n) Do these steps to monitor the fuel flow to make sure there is sufficient fuel to the APU fuel system:

- 1) Make sure the fuel flows into the 10 gallon (38 l) fuel resistant container, STD-200.
- 2) After two minutes, set the APU master switch [3] to the OFF position.
- 3) Make sure the fuel flow stops in less than 10 seconds.
- 4) If the fuel flow does not stop in less than 10 seconds, refer to the applicable operational test procedure for the APU fuel shutoff valve in the AMM FUEL, CHAPTER 28.
- 5) If the fuel flow stops in less than 10 seconds, the APU fuel shutoff valve is satisfactory.
- 6) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

- 7) Set the No. 1 AFT FUEL PUMP switch [5] or No. 1 FWD FUEL PUMP switch [4] to the OFF position.
  - 8) Measure the fuel in the 10 gallon (38 l) fuel resistant container, STD-200.
  - 9) If there is less than three gallons (11.4 liters) in the 10 gallon (38 l) fuel resistant container, STD-200, refer to the applicable troubleshooting procedure for the APU fuel distribution system in the FIM chapter 28.
  - 10) If there is more than three gallons (11.4 liters) in the 10 gallon (38 l) fuel resistant container, STD-200, the APU fuel system is satisfactory.
- (o) Disconnect the fuel hose from the fitting [6] on the 1088 bulkhead.
- (p) Remove the fuel hose and 10 gallon (38 l) fuel resistant container, STD-200.
- (q) Remove the plug from the fuel supply tube [7].
- (r) Apply a thin layer of aircraft turbine engine oil, D50055 on the threads of the fitting [6].
- (s) Connect the fuel supply tube [7] to the fitting [6] on the 1088 bulkhead.
- (t) Remove external electrical power from the airplane, if it is not necessary. To remove it, do this task: Remove External Power, TASK 24-22-00-860-814

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-00-860-021

(1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-00-860-012

(2) Remove the DO-NOT-OPERATE tag from the APU master switch.

SUBTASK 49-31-00-010-006

(3) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— END OF TASK —————

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## FUEL CONTROL UNIT - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the fuel control unit
- (2) An installation of the fuel control unit.

B. The fuel control unit is installed on the lube module. You can get access to the fuel control unit through the APU cowl door.

#### **TASK 49-31-11-000-801**

### 2. Fuel Control Unit Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-31-11-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-31-11-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-11-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.

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- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowling Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### E. Fuel Control Unit Removal

SUBTASK 49-31-11-020-001

- (1) Disconnect the electrical connector (P22) [14] from the fuel control unit [3].

SUBTASK 49-31-11-020-002

- (2) Do these steps to disconnect the fuel supply tube [2]:

**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049 under the fuel supply tube [2].
- (b) Disconnect the fuel supply tube [2] from the fitting [1] on the 1088 bulkhead.
- (c) Drain the fuel from the fuel supply tube [2] into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (d) Install the plugs on the fuel supply tube [2] and fitting [1] on the 1088 bulkhead.

SUBTASK 49-31-11-020-003

- (3) Do these steps to disconnect the four supply, return and drain tubes [7], [8], [9], [10] from the fuel control unit [3]:

- (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049 below the fuel control unit [3].
- (b) Loosen the three bolts [11] that attach the bracket [6] to the fuel control unit [3].
- (c) Disconnect the two return and supply tubes [9], [8] for the inlet guide vane (IGV) actuator and surge control valve, fuel drain tube [10] and manifold supply tube [7] from the fuel control unit [3].
- (d) Remove the six packings [13] and two packings [12] from the four tubes [7], [8], [9], [10].
  - 1) Discard the six packings [13] and two packings [12].
- (e) Drain the fuel from the four tubes [7], [8], [9], [10] into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (f) Install the caps on the four tubes [7], [8], [9], [10].

SUBTASK 49-31-11-020-004

- (4) Do these steps to remove the fuel control unit [3]:

- (a) Remove the coupling clamp [5] that attaches the fuel control unit [3] to the lube module.
- (b) Remove the fuel control unit [3].
- (c) Remove the packing [4] from the fuel control unit [3].
  - 1) Discard the packing [4].
- (d) Loosen the nut [15] that attaches the fuel supply tube [2] to the fuel control unit [3].

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- (e) Turn the tube retainer on the fuel supply tube [2] counterclockwise until the flange disengages from the stud.
- (f) Remove the fuel supply tube [2] from the fuel control unit [3].
- (g) Remove the two packings [16] from the fuel control unit [3].
  - 1) Discard the two packings [16].
- (h) Install a cap on the fuel supply tube [2].
- (i) Make sure you install all necessary protection covers.
- (j) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

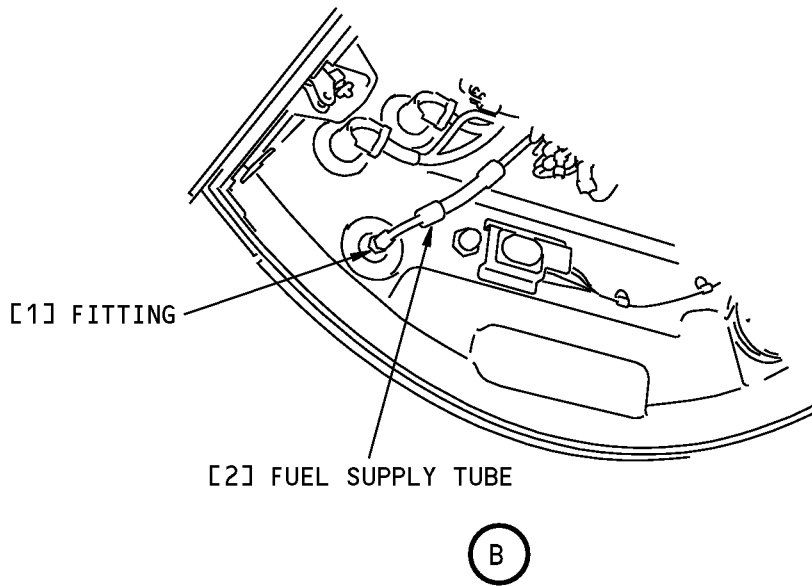
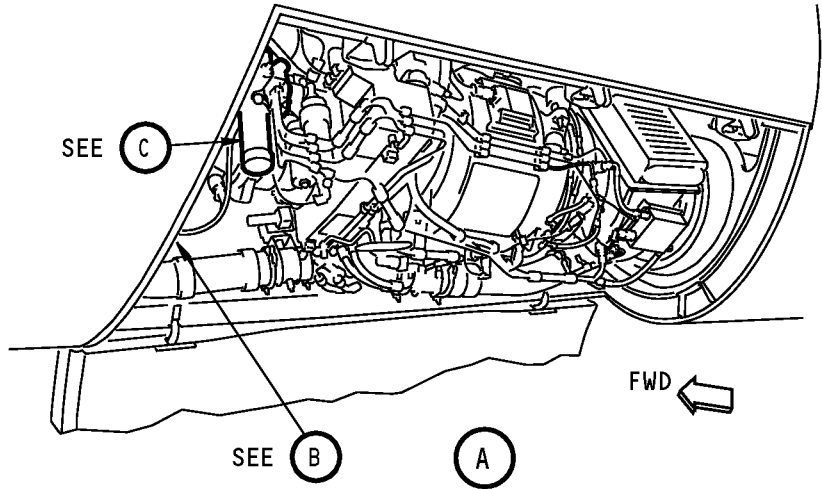
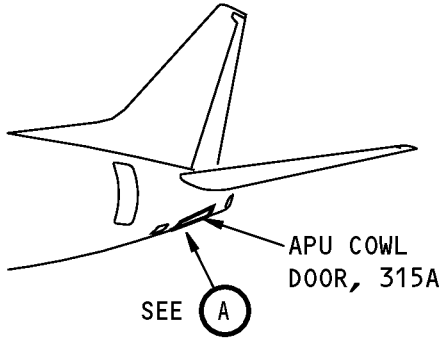
————— **END OF TASK** —————

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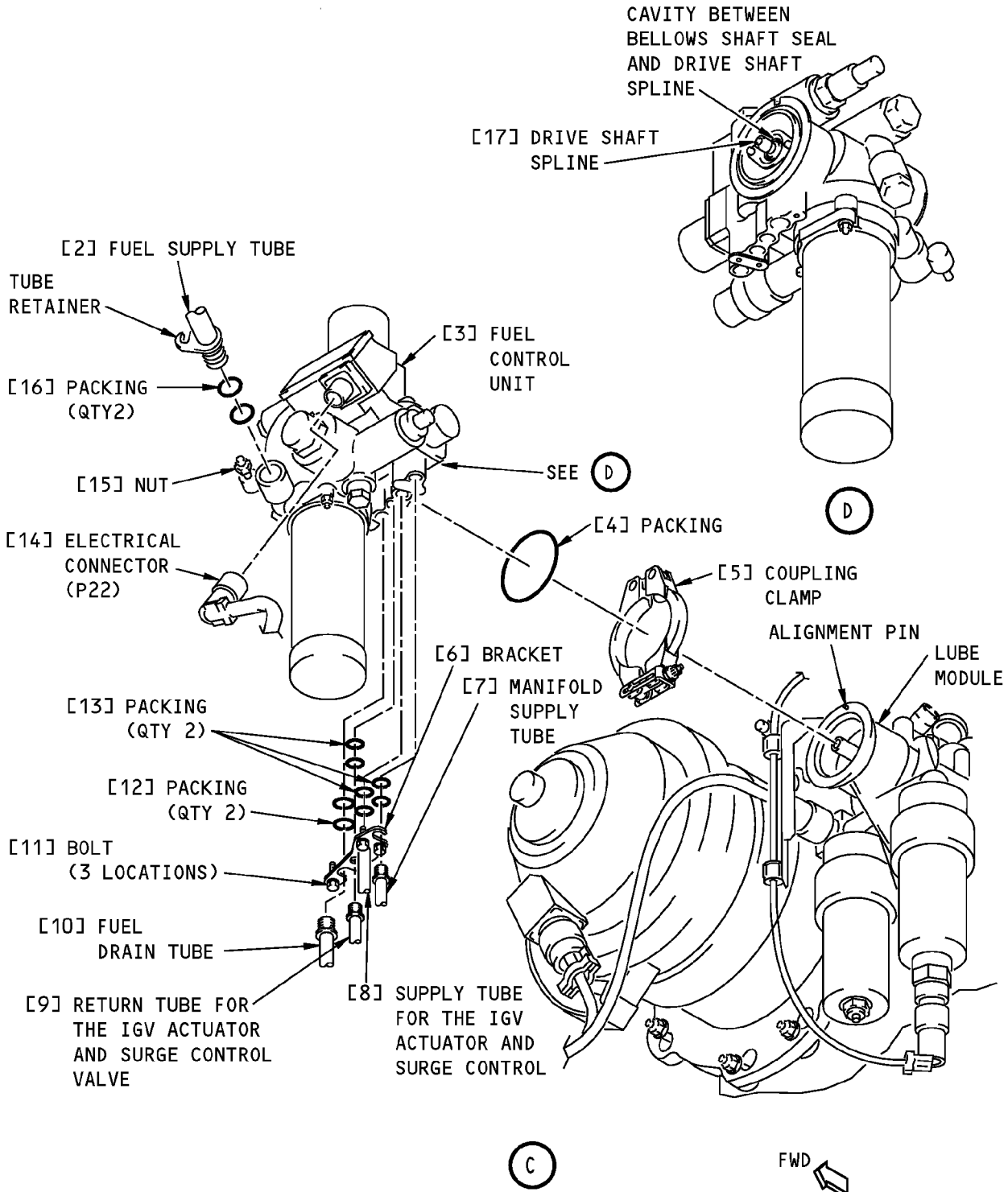
**Fuel Control Unit Installation  
Figure 401 (Sheet 1 of 2)/49-31-11-990-801**

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**Fuel Control Unit Installation**  
**Figure 401 (Sheet 2 of 2)/49-31-11-990-801**

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TASK 49-31-11-400-801

#### 3. Fuel Control Unit Installation

(Figure 401)

##### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

##### B. Tools/Equipment

Reference	Description
STD-2616	Dropper - Medicine, Conventional for adding equal drops of catalyst or curing agents to sealants and potting materials

##### C. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

##### D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Fuel supply tube	49-31-11-01-035	HAP 001-013, 015-026, 028-030
3	Fuel control unit	49-31-11-02-030	HAP 031-054, 101-999
		49-31-11-01-040	HAP 001-013, 015-026, 028-030
4	Packing	49-31-11-02-035	HAP 031-054, 101-999
		49-31-11-01-010	HAP 001-013, 015-026, 028-030
12	Packing	49-31-11-02-005	HAP 031-054, 101-999
		49-31-11-01-030	HAP 001-013, 015-026, 028-030
13	Packing	49-31-11-02-025	HAP 031-054, 101-999
		49-31-11-01-025	HAP 001-013, 015-026, 028-030
16	Packing	49-31-11-02-020	HAP 031-054, 101-999
		49-31-11-01-020	HAP 001-013, 015-026, 028-030
		49-31-11-02-015	HAP 031-054, 101-999

##### E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

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### F. Access Panels

Number	Name/Location
315A	APU Cowl Door

### G. Procedure

SUBTASK 49-31-11-420-001

- (1) Do these steps to connect the fuel supply tube [2] to the fuel control unit [3]:
  - (a) Remove the cap from the fuel supply tube [2].
  - (b) Lubricate the two new packings [16] with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.
  - (c) Install the two packings [16] on the fuel supply tube [2].
  - (d) Connect the fuel supply tube [2] to the fuel control unit [3].
  - (e) Turn the tube retainer on the fuel supply tube [2] clockwise until the flange fully engages the stud.
  - (f) Tighten the nut [15] to 40 pound-inches (4.5 newton-meters).

SUBTASK 49-31-11-420-002

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (2) Do these steps to install the fuel control unit [3]:
  - (a) Lubricate the new packing [4] with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.
  - (b) Install the packing [4] on the fuel control unit [3].
  - (c) Put the coupling clamp [5] on the lube module. Do not tighten the coupling clamp [5].

**WARNING:** DO NOT LET THE OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

**CAUTION:** MAKE SURE THAT YOU LUBRICATE THE BELLOWS SHAFT SEAL OF THE FUEL CONTROL UNIT WITH OIL. THE BELLOWS SHAFT SEAL LIFE CAN DECREASE WITHOUT OIL.

- (d) Lubricate the fuel control unit [3]:
  - 1) Make sure the drive shaft spine [17] of the fuel control unit [3] points up.
  - 2) Use the medicine dropper, STD-2616 to apply 40 drops or 2 cc of the aircraft turbine engine oil, D50055 to the cavity between the drive shaft spine [17] and the bellows shaft seal of the fuel control unit [3].
  - 3) Use the medicine dropper, STD-2616 to apply three or four drops of the aircraft turbine engine oil, D50055 on the drive shaft spline [17] of the fuel control unit [3].

**CAUTION:** YOU MUST HOLD THE FUEL CONTROL UNIT WHILE YOU INSTALL THE COUPLING CLAMP. IF YOU DO NOT HOLD THE FUEL CONTROL UNIT, IT CAN BEND THE DRIVE SHAFT IN THE LUBE MODULE. IT CAN ALSO FALL AND BECOME DAMAGED.

- (e) Carefully put the fuel control unit [3] in its position on the lube module.

**NOTE:** The fuel control unit [3] weighs approximately seven pounds (3.2 kg).

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- 1) Open the coupling clamp [5] to permit the hole on the fuel control unit [3] to engage the alignment pin on the lube module flange.
- 2) Make sure the alignment pin on the lube module is aligned and engages the hole on the fuel control unit [3].
- (f) Put the coupling clamp [5] over the flanges of the fuel control unit [3] and the lube module.
  - 1) Tighten the coupling clamp [5] to 60 pound-inches (6.8 newton-meters).

SUBTASK 49-31-11-420-003

- (3) Do these steps to connect the four supply, return and drain tubes [7], [8], [9], [10] to the fuel control unit [3]:
  - (a) Remove the caps from the four tubes [7], [8], [9], [10].
  - (b) Lubricate the two new packings [12] and six new packings [13] for the two supply and return tubes [8], [9] for the IGV actuator and surge control valve, fuel drain tube [10] and manifold supply tube [7] with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.
  - (c) Install the two packings [12] on the fuel drain tube [10].
  - (d) Install the four packings [13] on the two supply and return tubes [8], [9] for the IGV actuator and surge control valve.
  - (e) Install the two packings [13] on the manifold supply tube [7].
  - (f) Connect the four tubes [7], [8], [9], [10] with the bracket [6] to the fuel control unit [3].
  - (g) Tighten the three bolts [11] that attach the bracket [6] to the fuel control unit [3] to 50 pound-inches (5.7 newton-meters).
  - (h) Make sure the four tubes [7], [8], [9], [10] are installed in the clamps.

SUBTASK 49-31-11-420-004

- (4) Do these steps to connect the fuel supply tube [2]:
  - (a) Remove the plugs from the fuel supply tube [2] and fitting [1] on the 1088 bulkhead.
  - (b) Connect the fuel supply tube [2] to the fitting [1] on the 1088 bulkhead.

SUBTASK 49-31-11-420-005

- (5) Connect the electrical connector (P22) [14] to the fuel control unit [3].

#### H. Fuel Control Unit Installation Test

SUBTASK 49-31-11-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-11-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-31-11-740-001

- (3) Do the installation test for the fuel control unit:

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- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

NOTE: It may be necessary to start the APU more than three times after you replace the fuel control unit. If you start the APU again, make sure you obey the start duty cycle of three times during a 15 minute interval.

- (b) Operate the APU for a minimum of five minutes.

- (c) During the APU operation, examine the fuel control unit for signs of fuel leakage.

NOTE: A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted during an APU operation from the forward drain on the APU drain seal.

- (d) If you find more than the fuel leakage rate, then do these steps to repair the leakage:

1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.

3) Repair the cause of the fuel leakage.

4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

6) During the APU operation, examine the fuel control unit for signs of fuel leakage.

7) If you find more than the fuel leakage rate, then do the leakage repair again.

- (e) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

1) If maintenance message(s) show for the APU fuel system or the fuel control unit, refer to the applicable Maintenance Message Index in the FIM.

- (f) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

### I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-11-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

(a) Remove the two retainer pins from the two hold-open rods in the APU compartment.

(b) Disconnect the two hold-open rods from the two brackets.

(c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.

(d) Install the retainer pin in the rod end of the forward hold-open rod.

(e) Install the retainer pin to the spring clip on the aft hold-open rod.

(f) Close the APU Cowl Door, 315A.

(g) Close the three latches.

————— **END OF TASK** —————

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## FUEL CONTROL UNIT - INSPECTION/CHECK

### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has the task to do an inspection of the fuel control unit and the five fuel tubes.

#### **TASK 49-31-11-200-801**

### 2. Fuel Control Unit Inspection

(Figure 601)

#### A. General

- (1) This procedure is a scheduled maintenance task.

#### B. References

Reference	Title
49-31-11-000-801	Fuel Control Unit Removal (P/B 401)
49-31-11-400-801	Fuel Control Unit Installation (P/B 401)

#### C. Location Zones

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right

#### D. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### E. Prepare for the Inspection

SUBTASK 49-31-11-010-002

- (1) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

#### F. Procedure

SUBTASK 49-31-11-210-001

- (1) Do these steps to inspect the fuel control unit [1] and the five fuel tubes [2]:
  - (a) Visually examine the fuel control unit [1] and the five fuel tubes [2] for tightness and damage.
  - (b) Visually examine the fuel control unit [1] and the five fuel tubes [2] for fuel leakage.

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(c) If there are signs of fuel leakage from the fuel control unit [1] and/or the five fuel tubes [2], then replace the fuel control unit [1]. These are the tasks:

- Fuel Control Unit Removal, TASK 49-31-11-000-801
- Fuel Control Unit Installation, TASK 49-31-11-400-801

NOTE: It is not necessary to replace the fuel control unit if one or more fuel tubes are damaged. If you replace the damaged fuel tube(s), make sure you do the installation test of the fuel control unit for signs of fuel leakage.

(d) If there is no fuel leakage, then the fuel control unit [1] and the five fuel tubes [2] are satisfactory.

### G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-11-410-002

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- Remove the two retainer pins from the two hold-open rods in the APU compartment.
- Disconnect the two hold-open rods from the two brackets.
- Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- Install the retainer pin in the rod end of the forward hold-open rod.
- Install the retainer pin to the spring clip on the aft hold-open rod.
- Close the APU Cowl Door, 315A.
- Close the three latches.

————— **END OF TASK** —————

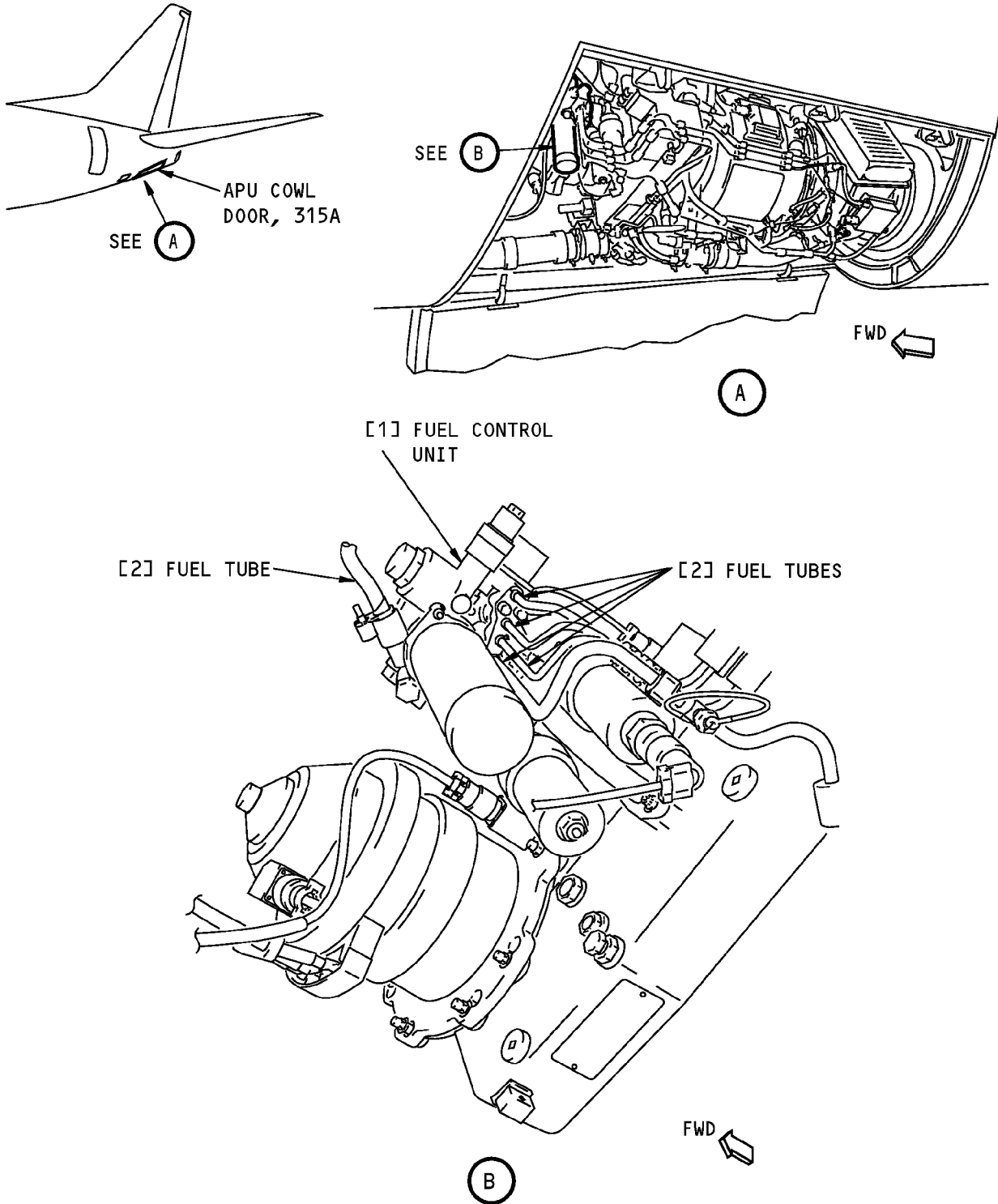
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**Fuel Control Unit Inspection  
Figure 601/49-31-11-990-802**

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## FUEL NOZZLE - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the fuel nozzle
- (2) An installation of the fuel nozzle.

B. Ten fuel nozzles are installed on the combustor housing.

#### **TASK 49-31-14-000-801**

### 2. Fuel Nozzle Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-31-14-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-31-14-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-14-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.

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- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### E. Fuel Nozzle Removal

SUBTASK 49-31-14-020-002

**CAUTION:** DO NOT REMOVE ALL THE FUEL NOZZLES FROM THE COMBUSTOR HOUSING AT THE SAME TIME. YOU CAN REMOVE THE FUEL NOZZLE IF THERE ARE TWO ADJACENT FUEL NOZZLES. THE MAXIMUM NUMBER OF FUEL NOZZLES THAT YOU CAN REMOVE AT THE SAME TIME IS FIVE. IF YOU REMOVE ALL THE FUEL NOZZLES, THE COMBUSTOR LINER WILL NOT ALIGN WITH THE FUEL NOZZLES ON THE COMBUSTOR HOUSING.

(1) Do these steps to remove the fuel nozzle [4]:

- (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049 below the combustor housing.

**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Disconnect the two fittings [1], [2] for the primary and secondary fuel manifolds from the fuel nozzle [4].
- (c) Drain the fuel from the two fittings [1], [2] into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (d) Install the caps on the two fittings [1], [2].
- (e) Remove the two pins [7] and plate [6] from the two bolts [5].
  - 1) Discard the two pins [7].
- (f) Remove the two bolts [5] from the fuel nozzle [4].
- (g) Remove the fuel nozzle [4], gasket [8] and shroud [3] from the combustor housing.
  - 1) Discard the gasket [8].
- (h) Make sure you install all necessary protection covers.
- (i) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

————— **END OF TASK** —————

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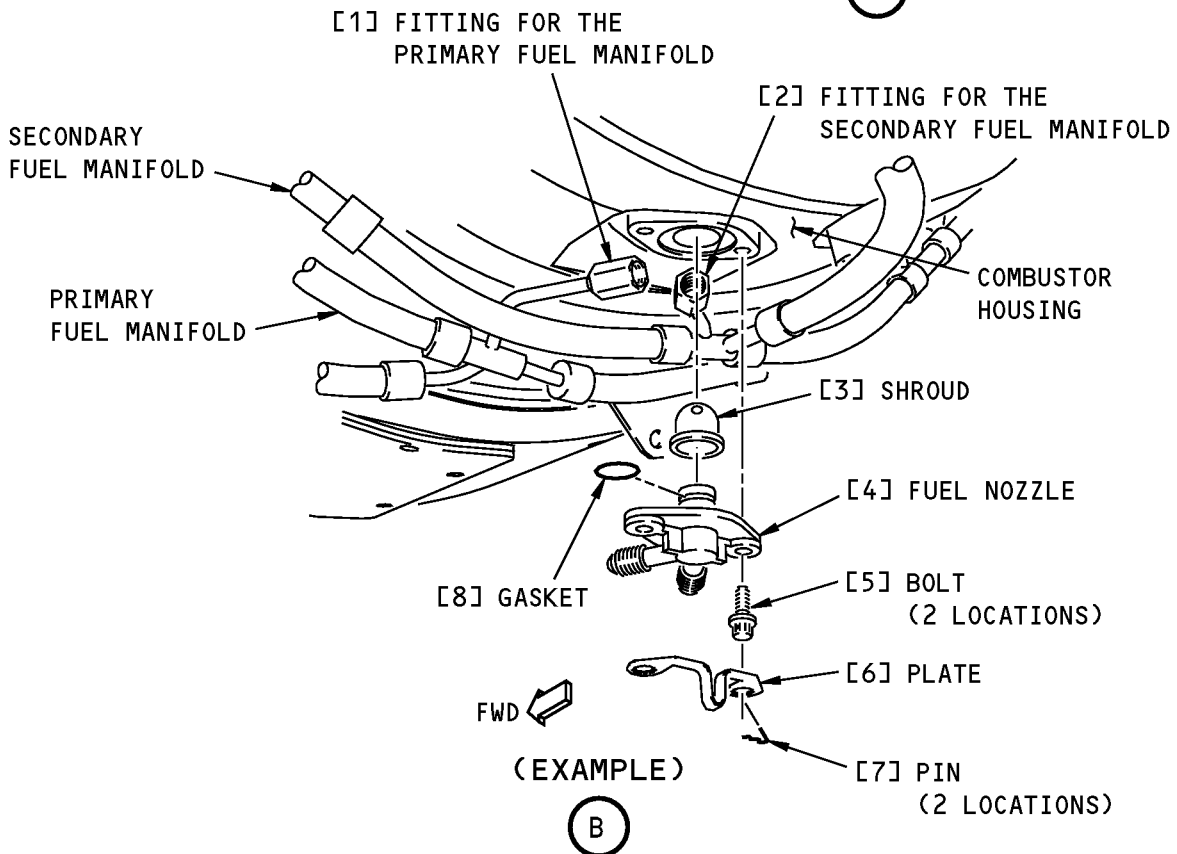
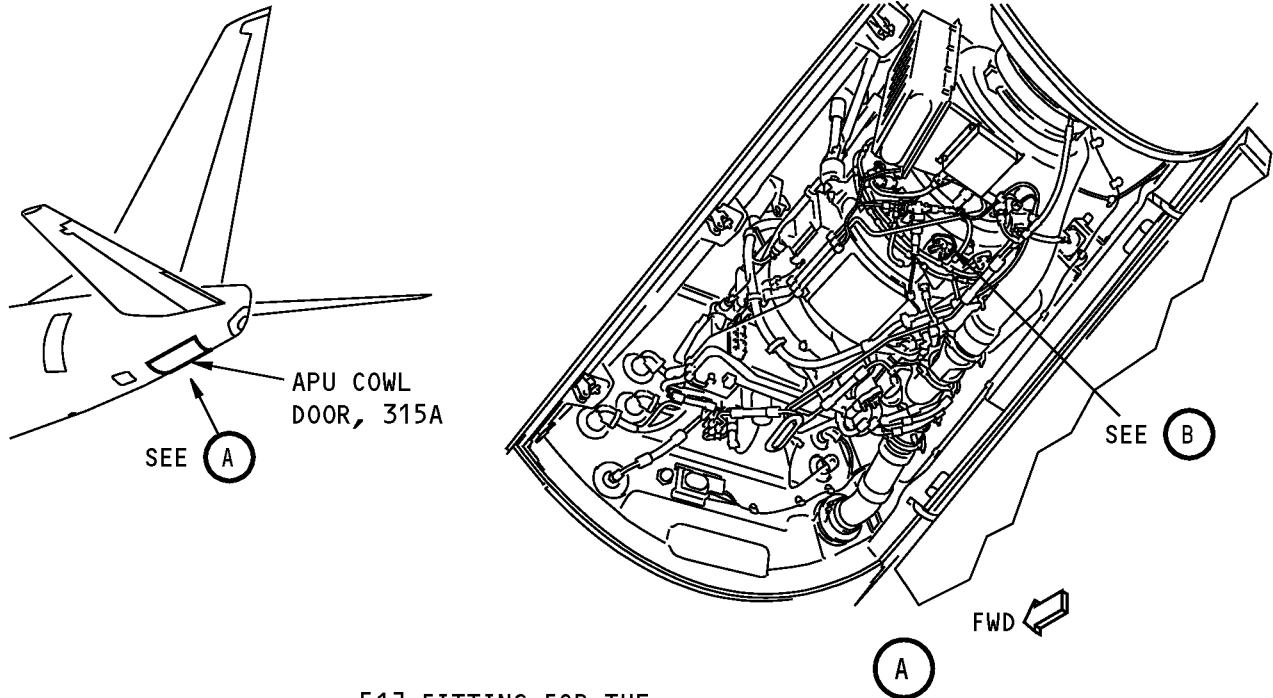
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**Fuel Nozzle Installation  
Figure 401/49-31-14-990-801**

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**TASK 49-31-14-400-801**

#### 3. Fuel Nozzle Installation

(Figure 401)

##### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

##### B. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236

##### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Fuel nozzle	49-31-14-01-020	HAP 001-013, 015-026, 028-030
		49-31-14-02-020	HAP 031-054, 101-999
7	Pin	49-31-14-01-005	HAP 001-013, 015-026, 028-030
		49-31-14-02-005	HAP 031-054, 101-999
8	Gasket	49-31-14-01-025	HAP 001-013, 015-026, 028-030
		49-31-14-02-025	HAP 031-054, 101-999

##### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

##### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### F. Procedure

SUBTASK 49-31-14-420-002

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the fuel nozzle [4]:
  - (a) Apply a thin layer of Never-Seez NSBT-8N compound, D00006 on the threads of the two bolts [5].
  - (b) Lubricate the new gasket [8] with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.

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**CAUTION:** MAKE SURE THAT THE HOLE IN THE SHROUD IS CENTERED OVER THE ALIGNMENT PIN ON THE FUEL NOZZLE. IF THE SHROUD IS NOT INSTALLED CORRECTLY ON THE FUEL NOZZLE, DAMAGE TO THE APU CAN OCCUR.

- (c) Install the shroud [3], gasket [8] and fuel nozzle [4] in the combustor housing with the two bolts [5].

**NOTE:** You install the gasket [8] on the fuel nozzle.

- 1) Tighten the two bolts [5] to 60 pound-inches (6.8 newton-meters).
- (d) Install the plate [6] on the two bolts [5].
- (e) Install the two pins [7] in the two bolts [5] to attach the plate [6] to the two bolts.
- (f) Remove the caps from the two fittings [1], [2].
- (g) Connect the two fittings [1], [2] for the primary and secondary fuel manifolds to the fuel nozzle [4].
  - 1) Tighten the two fittings [1], [2] to 120 pound-inches (13.6 newton-meters).

#### G. Fuel Nozzle Installation Test

SUBTASK 49-31-14-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-14-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-31-14-790-001

- (3) Do the installation test for the fuel nozzle:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

**NOTE:** It may be necessary to start the APU more than three times after you replace the fuel nozzle. If you start the APU again, make sure you obey the start duty cycle of three times during a 15 minute interval.
  - (b) Operate the APU for a minimum of five minutes.
  - (c) During the APU operation, examine the fuel nozzle for signs of fuel leakage.
  - (d) If you find fuel leakage, do these steps to repair the leakage:
    - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
    - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
    - 3) Repair the cause of the fuel leakage.
    - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
    - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

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- 6) During the APU operation, examine the fuel nozzle for signs of fuel leakage.
- 7) If you find fuel leakage, do the leakage repair again.
- (e) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-14-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— END OF TASK —————

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## FUEL NOZZLE - INSPECTION/CHECK

### 1. General

A. This procedure has the task to inspect the fuel nozzle. Ten fuel nozzles are installed on the combustor housing.

#### **TASK 49-31-14-200-801**

### 2. Fuel Nozzle Inspection

#### A. References

Reference	Title
49-31-14-000-801	Fuel Nozzle Removal (P/B 401)
49-31-14-400-801	Fuel Nozzle Installation (P/B 401)

#### B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### C. Procedure

SUBTASK 49-31-14-020-001

(1) Do this task: Fuel Nozzle Removal, TASK 49-31-14-000-801.

SUBTASK 49-31-14-210-001

(2) Do these steps to inspect the fuel nozzle:

- (a) Examine the two inlet fittings for the fuel nozzle for crossed, stripped and peened threads.
- (b) Examine the mounting flange for burrs and nicks.
- (c) Examine the fuel nozzle for burrs, nicks, scratches and carbon buildup.
- (d) Examine the fuel nozzle for blockage.
- (e) Examine the locating pin for damage.
- (f) If you find any of the above damage, replace the fuel nozzle.

SUBTASK 49-31-14-420-001

(3) Do this task: Fuel Nozzle Installation, TASK 49-31-14-400-801.

————— **END OF TASK** —————

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## FUEL FLOW DIVIDER - REMOVAL/INSTALLATION

### 1. General

- A. This procedure has these tasks:
  - (1) A removal of the fuel flow divider
  - (2) An installation of the fuel flow divider.
- B. The fuel flow divider is installed between the compressor inlet section and eductor housing at the 6 o'clock position.
- C. The flow divider solenoid is a part of the fuel flow divider.

### **TASK 49-31-15-000-801**

### 2. Fuel Flow Divider Removal

(Figure 401)

#### A. Tools/Equipment

Reference	Description
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

#### B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### C. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### D. Prepare for the Removal

SUBTASK 49-31-15-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-31-15-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-15-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.

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- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### E. Fuel Flow Divider Removal

SUBTASK 49-31-15-020-001

- (1) Disconnect the electrical connector (P23) [17] from the flow divider solenoid [16].

SUBTASK 49-31-15-020-002

- (2) Do these steps to disconnect the fuel supply tube and two fuel manifolds from the fuel flow divider [1]:
  - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049 below the fuel flow divider [1].

**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Disconnect the fitting for the fuel supply tube [3] from the fuel flow divider [1].
- (c) Disconnect the fitting for the primary fuel manifold [2] from the fuel flow divider [1].
- (d) Disconnect the fitting for the secondary fuel manifold [13] from the flow divider solenoid [16].
- (e) Drain the fuel from the three fittings [2], [3], [13] into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (f) Install the caps on the three fittings [2], [3], [13].

SUBTASK 49-31-15-020-003

- (3) Do these steps to remove the fuel flow divider [1]:
  - (a) Remove the two nuts [10] and two bolts [7] that attach the two ground straps [9] to the flow divider solenoid [16].
  - (b) Remove the bolt [15] that attaches the clamp [14] to the bracket.
  - (c) Remove the fuel flow divider [1] and clamp [14].
  - (d) Remove the clamp [14].
  - (e) Make sure you install all necessary protection covers.
  - (f) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

SUBTASK 49-31-15-020-004

- (4) Do these steps to remove the flow divider solenoid [16]:

**NOTE:** It is necessary to remove the flow divider solenoid [16] if there is a problem with the fuel flow divider [1].

- (a) Loosen the nut [4] until you can remove the fuel flow divider [1] from the flow divider solenoid [16].
- (b) Remove the flow divider solenoid [16].

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- (c) Remove the nut [4], packing retainer [5] and packing [6].
  - 1) Discard the packing [6].
- (d) Remove the union [12] and packing [11] from the flow divider solenoid [16].
  - 1) Discard the packing [11].

————— **END OF TASK** —————

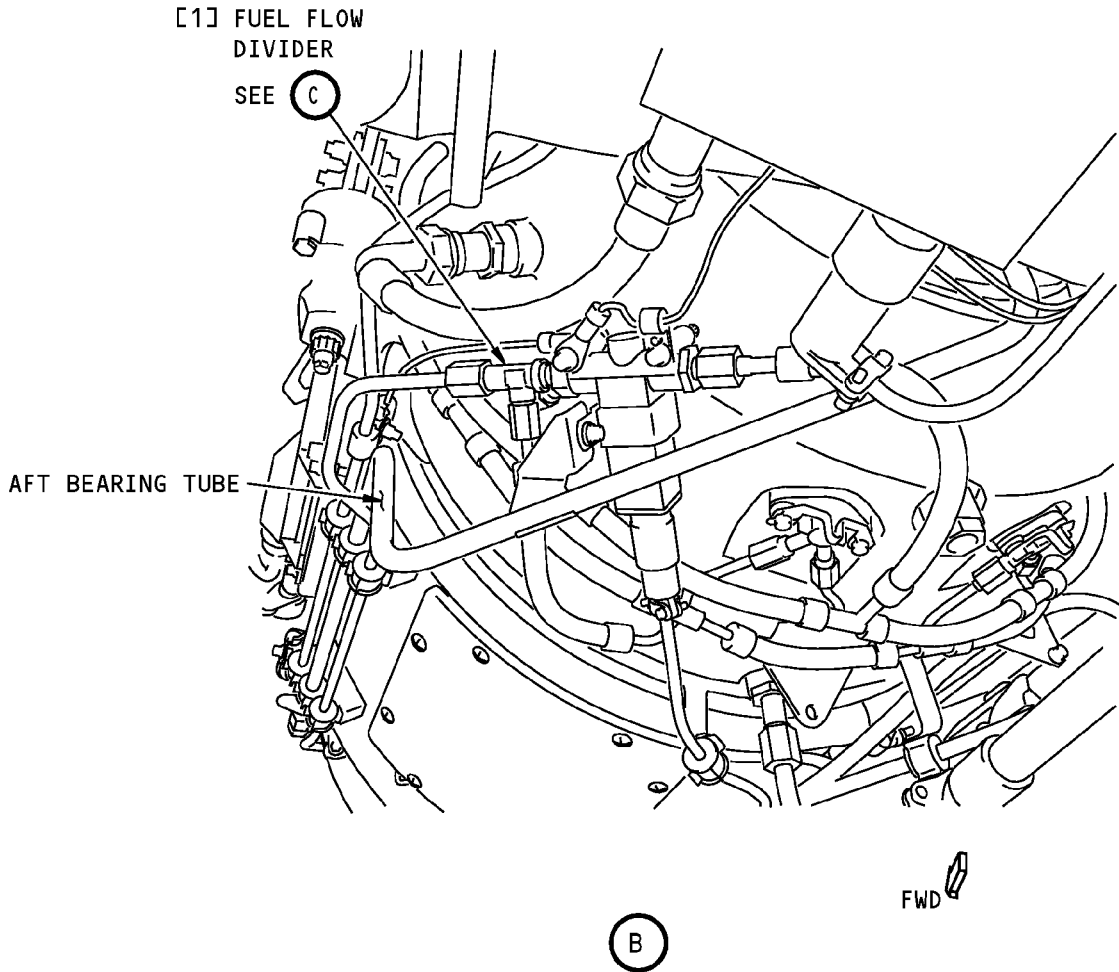
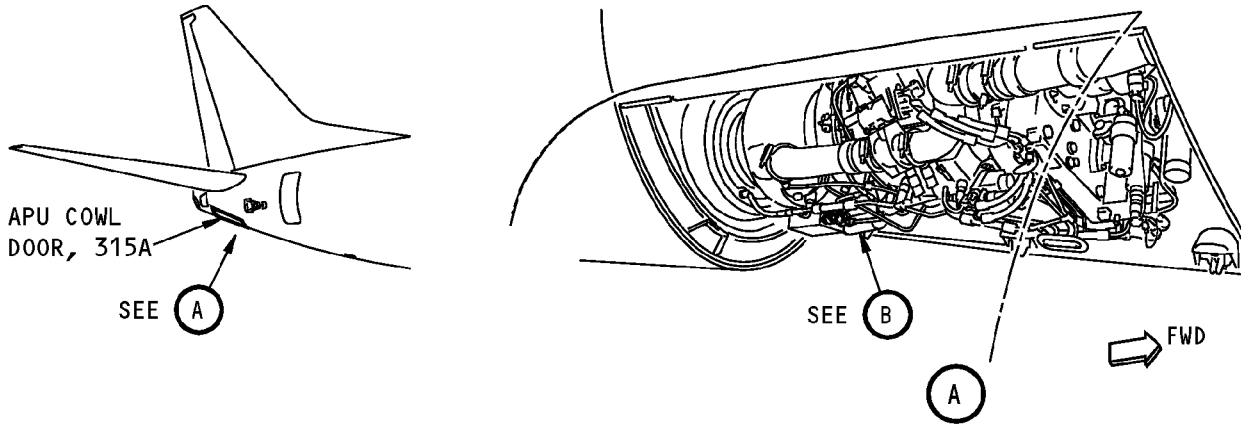
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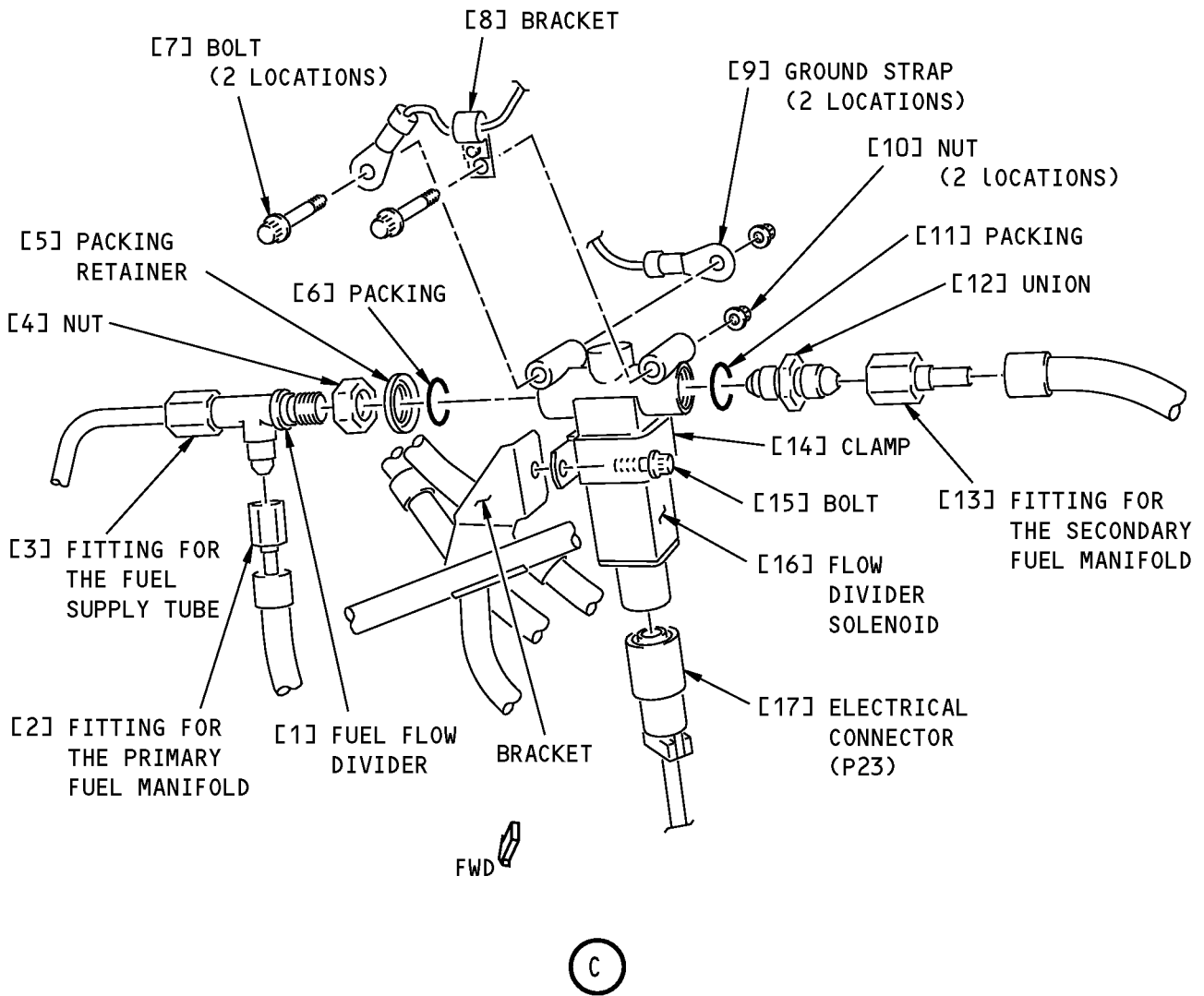
**Fuel Flow Divider Installation  
Figure 401 (Sheet 1 of 2)/49-31-15-990-801**

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**Fuel Flow Divider Installation  
Figure 401 (Sheet 2 of 2)/49-31-15-990-801**

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#### TASK 49-31-15-400-801

### 3. Fuel Flow Divider Installation

(Figure 401)

#### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

#### B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236

#### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Fuel flow divider	49-31-15-01-050	HAP 001-013, 015-026, 028-030
		49-31-15-02-030	HAP 031-054, 101-999
6	Packing	49-31-15-01-035	HAP 001-013, 015-026, 028-030
		49-31-15-02-015	HAP 031-054, 101-999
11	Packing	49-31-15-01-035	HAP 001-013, 015-026, 028-030
		49-31-15-02-015	HAP 031-054, 101-999
16	Flow divider solenoid	49-31-15-01-040	HAP 001-013, 015-026, 028-030
		49-31-15-02-020	HAP 031-054, 101-999

#### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### F. Procedure

SUBTASK 49-31-15-420-001

- (1) If the flow divider solenoid [16] was removed from the fuel flow divider [1], install the flow divider solenoid:
  - (a) Lubricate the new packing [6] and new packing [11] for the flow divider solenoid [16] with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.
  - (b) Put the packing [6] and packing retainer [5] in the flow divider solenoid [16].
  - (c) Install the nut [4] on the fuel flow divider [1].

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(d) Install the fuel flow divider [1] with the nut [4] on the flow divider solenoid [16].

NOTE: Do not tighten the nut at this time.

(e) Install the packing [11] on the union [12].

(f) Install the union [12] on the flow divider solenoid [16].

1) Tighten the union [12] to 140 pound-inches (15.8 newton-meters).

SUBTASK 49-31-15-420-002

CAUTION: REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

(2) Do these steps to install the fuel flow divider [1]:

(a) Install the clamp [14] and flow divider solenoid [16] to the bracket with the bolt [15].

NOTE: Do not tighten the bolt at this time.

(b) Install the two ground straps [9] and bracket [8] to the flow divider solenoid [16] with the two bolts [7] and two nuts [10].

1) Tighten the two bolts [7] to 60 pound-inches (6.8 newton-meters).

SUBTASK 49-31-15-420-003

(3) Do these steps to connect the fuel supply tube and two fuel manifolds to the fuel flow divider [1]:

(a) Remove the caps from the three fittings [2], [3], [13].

(b) Connect the fitting for the primary fuel manifold [2] to the fuel flow divider [1].

(c) Connect the fitting for the secondary fuel manifold [13] to the flow divider solenoid [16].

(d) Connect the fitting for the fuel supply tube [3] to the fuel flow divider [1].

1) Tighten the fitting [3] to 140 pound-inches (15.8 newton-meters).

(e) Tighten the fitting for the primary fuel manifold [2] to 140 pound-inches (15.8 newton-meters).

(f) Tighten the fitting for the secondary fuel manifold [13] to 140 pound-inches (15.8 newton-meters).

(g) Tighten the bolt [15] on the clamp [14] to 50 pound-inches (5.6 newton-meters).

(h) Tighten the nut [4] on the fuel flow divider [1] to 140 pound-inches (15.8 newton-meters).

(i) Make sure the primary fuel manifold does not touch the aft bearing tube.

SUBTASK 49-31-15-420-004

(4) Connect the electrical connector (P23) [17] to the flow divider solenoid [16].

G. Fuel Flow Divider Installation Test

SUBTASK 49-31-15-860-003

(1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-31-15-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-31-15-790-001

- (3) Do the installation test for the fuel flow divider:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Operate the APU for a minimum of five minutes.
  - (c) During the APU operation, examine the fuel flow divider for signs of fuel leakage.
  - (d) If you find fuel leakage, do these steps to repair the leakage:
    - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
    - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
    - 3) Repair the cause of the fuel leakage.
    - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
    - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
    - 6) During the APU operation, examine the fuel flow divider for signs of fuel leakage.
    - 7) If you find fuel leakage, do the leakage repair again.
  - (e) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-15-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

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## FUEL MANIFOLD ASSEMBLY - REMOVAL/INSTALLATION

### 1. General

- A. This procedure has these tasks:
  - (1) A removal of the primary fuel manifold
  - (2) An installation of the primary fuel manifold
  - (3) A removal of the secondary fuel manifold
  - (4) An installation of the secondary fuel manifold.
- B. The fuel manifold assembly has two fuel manifolds on the APU. The primary and the secondary fuel manifolds are installed on the combustor housing.

### **TASK 49-31-16-000-801**

### 2. Primary Fuel Manifold Removal

(Figure 401)

#### A. Tools/Equipment

Reference	Description
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

#### B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### C. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### D. Prepare for the Removal

SUBTASK 49-31-16-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-31-16-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-16-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

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- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### E. Primary Fuel Manifold Removal

SUBTASK 49-31-16-020-001

**WARNING:** DO NOT TOUCH THE FUEL MANIFOLD ASSEMBLY IF THE APU IS HOT. THE FUEL MANIFOLD ASSEMBLY IS HOT AFTER THE APU IS OPERATED. HOT COMPONENTS CAN BURN YOU.

(1) Do these steps to remove the primary fuel manifold [1]:

- (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049 below the combustor housing.

**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Disconnect the fitting for the primary fuel manifold [10] from the fuel flow divider [6].
- (c) Disconnect the 10 fittings for the primary fuel manifold [3] from the 10 fuel nozzles [4].
- (d) Drain the fuel from the 11 fittings [3], [10] into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (e) Install the caps on the 11 fittings [3], [10].
- (f) Remove the primary fuel manifold [1].
- (g) Make sure you install all necessary protection covers.
- (h) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

————— **END OF TASK** —————

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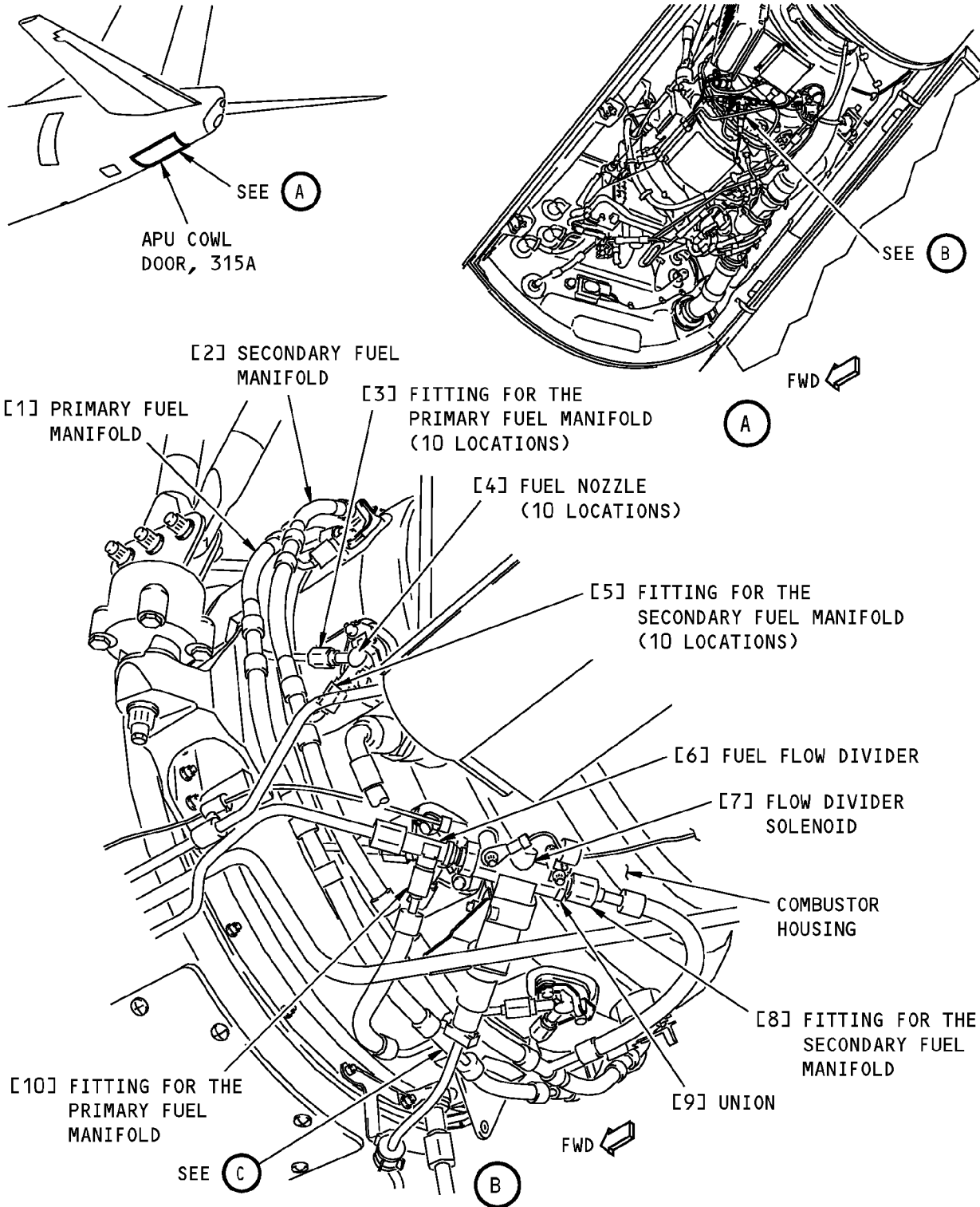
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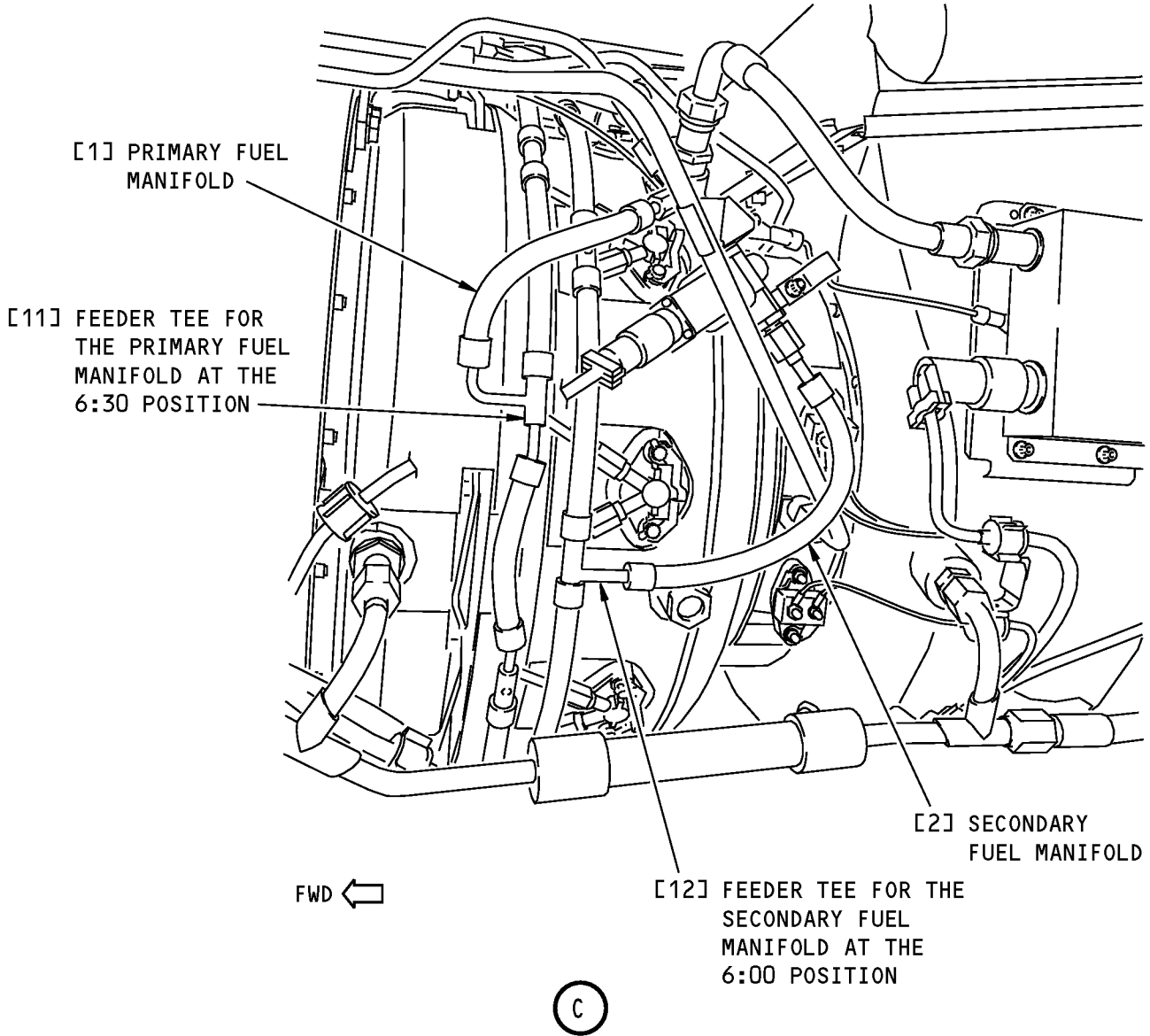
**Fuel Manifold Assembly Installation**  
**Figure 401 (Sheet 1 of 2)/49-31-16-990-801**

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**Fuel Manifold Assembly Installation  
Figure 401 (Sheet 2 of 2)/49-31-16-990-801**

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#### TASK 49-31-16-400-801

#### 3. Primary Fuel Manifold Installation

(Figure 401)

##### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

##### B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Primary fuel manifold	49-31-16-01-010	HAP 001-013, 015-026, 028-030
		49-31-16-02-010	HAP 031-054, 101-999

##### C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

##### D. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### E. Procedure

SUBTASK 49-31-16-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the primary fuel manifold [1]:
  - (a) Remove the caps from the 11 fittings [3], [10].
  - (b) Install the primary fuel manifold [1] on the combustor housing.
 

**NOTE:** The feeder tee for the primary fuel manifold [1] must be at the 6:30 position.
  - (c) Connect the 10 fittings for the primary fuel manifold [3] to the 10 fuel nozzles [4].
    - 1) Tighten the 10 fittings [3] to 120 pound-inches (13.6 newton-meters).
  - (d) Connect the fitting for the primary fuel manifold [10] to the fuel flow divider [6].
    - 1) Tighten the fitting [10] to 140 pound-inches (15.8 newton-meters).

##### F. Primary Fuel Manifold Installation Test

SUBTASK 49-31-16-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-16-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-31-16-790-001

- (3) Do the installation test for the primary fuel manifold:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Operate the APU for a minimum of five minutes.
  - (c) During the APU operation, examine the primary fuel manifold for signs of fuel leakage.
  - (d) If you find fuel leakage, do these steps to repair the leakage:
    - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
    - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
    - 3) Repair the cause of the fuel leakage.
    - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
    - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
    - 6) During the APU operation, examine the primary fuel manifold for signs of fuel leakage.
    - 7) If you find fuel leakage, do the leakage repair again.
  - (e) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-16-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

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**TASK 49-31-16-000-802**

**4. Secondary Fuel Manifold Removal**

(Figure 401)

**A. Tools/Equipment**

<u>Reference</u>	<u>Description</u>
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

**B. Location Zones**

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

**C. Access Panels**

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

**D. Prepare for the Removal**

SUBTASK 49-31-16-860-005

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-31-16-860-006

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-16-010-002

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

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#### E. Secondary Fuel Manifold Removal

SUBTASK 49-31-16-020-002

**WARNING:** DO NOT TOUCH THE FUEL MANIFOLD ASSEMBLY IF THE APU IS HOT. THE FUEL MANIFOLD ASSEMBLY IS HOT AFTER THE APU IS OPERATED. HOT COMPONENTS CAN BURN YOU.

(1) Do these steps to remove the secondary fuel manifold [2]:

(a) Put the 1 gallon (4 l) fuel resistant container, STD-4049 below the combustor housing.

**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(b) Disconnect the fitting for the secondary fuel manifold [8] from the union [9] on the flow divider solenoid [7].

(c) Disconnect the 10 fittings for the secondary fuel manifold [5] from the 10 fuel nozzles [4].

(d) Drain the fuel from the 11 fittings [5], [8] into the 1 gallon (4 l) fuel resistant container, STD-4049.

(e) Install the caps on the 11 fittings [5], [8].

(f) Remove the secondary fuel manifold [2].

(g) Make sure you install all necessary protection covers.

(h) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

————— **END OF TASK** —————

#### TASK 49-31-16-400-802

#### 5. Secondary Fuel Manifold Installation

(Figure 401)

##### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

##### B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Secondary fuel manifold	49-31-16-01-005	HAP 001-013, 015-026, 028-030
		49-31-16-02-005	HAP 031-054, 101-999

##### C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

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## D. Access Panels

Number	Name/Location
315A	APU Cowl Door

## E. Procedure

SUBTASK 49-31-16-420-002

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the secondary fuel manifold [2]:
  - (a) Remove the caps from the 11 fittings [5], [8].
  - (b) Install the secondary fuel manifold [2] on the combustor housing.
 

NOTE: The feeder tee for the secondary fuel manifold [12] must be at the 6:00 position.
  - (c) Connect the 10 fittings for the secondary fuel manifold [5] to the 10 fuel nozzles [4].
    - 1) Tighten the 10 fittings [5] to 120 pound-inches (13.6 newton-meters).
  - (d) Connect the fitting for the secondary fuel manifold [8] to the union [9] on the flow divider solenoid [7].
    - 1) Tighten the fitting [8] to 140 pound-inches (15.8 newton-meters).

## F. Secondary Fuel Manifold Installation Test

SUBTASK 49-31-16-860-007

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-16-860-008

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-31-16-790-002

- (3) Do the installation test for the secondary fuel manifold:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Operate the APU for a minimum of five minutes.
  - (c) During the APU operation, examine the secondary fuel manifold for signs of fuel leakage.
  - (d) If you find fuel leakage, do these steps to repair the leakage:
    - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
    - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
    - 3) Repair the cause of the fuel leakage.
    - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

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- 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - 6) During the APU operation, examine the secondary fuel manifold for signs of fuel leakage.
  - 7) If you find fuel leakage, do the leakage repair again.
- (e) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

### G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-16-410-002

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

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INLET FUEL FILTER ELEMENT - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
  - (1) A removal of the inlet fuel filter element
  - (2) An installation of the inlet fuel filter element.
- C. The inlet fuel filter element is referred to as the fuel filter element.
- D. The fuel filter element is installed on the fuel control unit. You can get access to the fuel filter element through the APU cowl door.

**TASK 49-31-21-000-801**

2. Inlet Fuel Filter Element Removal

(Figure 401)

- A. General
  - (1) This procedure is a scheduled maintenance task.
- B. Tools/Equipment

Reference	Description
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Prepare for the Removal

SUBTASK 49-31-21-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-31-21-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-31-21-010-001

(3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### F. Inlet Fuel Filter Element Removal

SUBTASK 49-31-21-020-001

(1) Do these steps to remove the fuel filter element [3]:

- (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049 below the fuel filter housing [1].

**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Loosen the two nuts [4] that attach the fuel filter housing [1] to the fuel control unit.
- (c) Turn the fuel filter housing [1] counterclockwise until the flange disengages from the two studs.
- (d) Remove the fuel filter housing [1].
- (e) Remove the packing [2] from the fuel filter housing [1].
  - 1) Discard the packing [2].
- (f) Remove the fuel filter element [3].
  - 1) Discard the fuel filter element [3].
- (g) Make sure you install all necessary protection covers.
- (h) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

————— **END OF TASK** —————

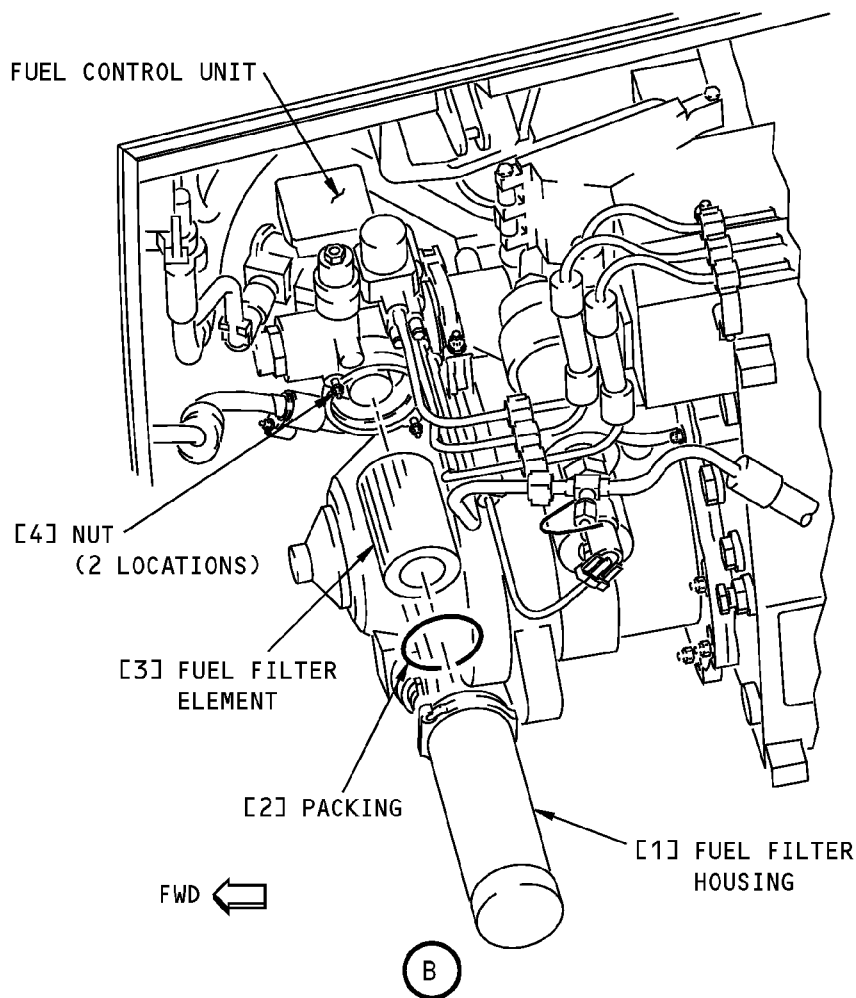
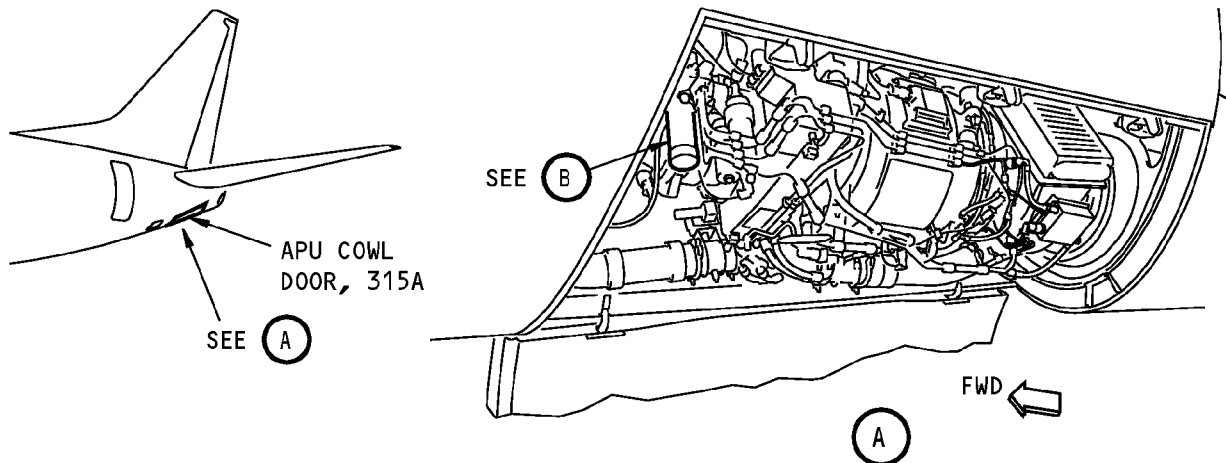
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**Inlet Fuel Filter Element Installation  
Figure 401/49-31-21-990-801**

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#### TASK 49-31-21-400-801

#### 3. Inlet Fuel Filter Element Installation

(Figure 401)

##### A. General

(1) This procedure is a scheduled maintenance task.

##### B. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

##### C. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

##### D. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

##### E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	49-31-11-01-055	HAP 001-013, 015-026, 028-030
3	Fuel filter element	49-31-11-02-060	HAP 031-054, 101-999
		49-31-11-01-060	HAP 001-013, 015-026, 028-030
		49-31-11-02-065	HAP 031-054, 101-999

##### F. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

##### G. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### H. Procedure

SUBTASK 49-31-21-110-001

(1) Do these steps to clean the fuel filter housing [1]:

(a) Clean the fuel filter housing [1] with alcohol, B00130 and a cotton wiper, G00034.

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- (b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the fuel filter housing [1].

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the fuel filter housing [1].

SUBTASK 49-31-21-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (2) Do these steps to install the fuel filter element [3]:
  - (a) Lubricate the new new packing [2] with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.
  - (b) Install the packing [2] on the fuel filter housing [1].
  - (c) Lubricate the packing on the new fuel filter element [3] with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.
  - (d) Install the fuel filter element [3] in the fuel control unit.
  - (e) Install the fuel filter housing [1] on the fuel control unit.
  - (f) Turn the fuel filter housing [1] clockwise until the flange fully engages the two studs.
  - (g) Tighten the two nuts [4] to 40 pound-inches (4.5 newton-meters).

#### I. Inlet Fuel Filter Element Installation Test

SUBTASK 49-31-21-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-21-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-31-21-790-001

- (3) Do the installation test for the fuel filter element:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 

**NOTE:** It may be necessary to start the APU more than three times after you replace the fuel filter element. If you start the APU again, make sure you obey the start duty cycle of three times during a 15 minute interval.

**NOTE:** Air in the airplane fuel system and/or fuel filter housing can cause an APU BITE maintenance message 49-31171 to show on the control display unit (CDU) display.
  - (b) Operate the APU for a minimum of five minutes.
  - (c) During the APU operation, examine the fuel filter housing for signs of fuel leakage.
  - (d) If you find fuel leakage, do these steps to repair the leakage:
    - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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- 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
  - 3) Repair the cause of the fuel leakage.
  - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
  - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - 6) During the APU operation, examine the fuel filter housing for signs of fuel leakage.
  - 7) If you find fuel leakage, do the leakage repair again.
- (e) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-21-410-001

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

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## STARTER-GENERATOR - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the starter-generator
- (2) An installation of the starter-generator.

B. The starter-generator is installed on the front of the APU.

#### **TASK 49-41-21-000-801**

### 2. Starter-Generator Removal

(Figure 401)

A. References

Reference	Title
49-52-13-000-801	Bleed Air Duct Removal (P/B 401)
52-48-21-000-801	Auxiliary Power Unit (APU) Cowl Door Removal (P/B 401)

B. Tools/Equipment

**NOTE:** When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1462	Hoist - Fishpole (Part #: 10/3641, Supplier: K1425, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -ALL, -BBJ) (Part #: F80039-1, Supplier: 81205, A/P Effectivity: 737-100, -200, -200C, -300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: PF51-003-1, Supplier: 06714, A/P Effectivity: 737-ALL) (Opt Part #: MINILIFT, Supplier: K1425, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -ALL, -BBJ)
COM-1592	Hoist - Fishpole (chain) (Part #: AP6108, Supplier: 4Y309, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -ALL)
SPL-1626	Eye - Lifting, APU Generator (Part #: A49002-2, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-4157	Hoist - Fishpole, 500lb Capacity, 35 Foot Cable, 5 to 9 Foot Adjustable Telescoping Barrel (Part #: PF51-003-1, Supplier: 06714, A/P Effectivity: 737-ALL)
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)

C. Location Zones

Zone	Area
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

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### E. Prepare for the Removal

SUBTASK 49-41-21-010-001

(1) Do this task: Auxiliary Power Unit (APU) Cowl Door Removal, TASK 52-48-21-000-801.

SUBTASK 49-41-21-020-001

(2) Do this task: Bleed Air Duct Removal, TASK 49-52-13-000-801.

SUBTASK 49-41-21-860-001

(3) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT
B	14	C01424	AUX POWER UNIT SCU FAN POWER

SUBTASK 49-41-21-010-002

(4) Open this access door:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 49-41-21-860-004

(5) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

### F. Starter-Generator Removal

SUBTASK 49-41-21-020-002

**WARNING:** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

(1) Do these steps to disconnect the electrical connectors [2], [3]:

- Disconnect the electrical connector (P5) [2] from the starter-generator [1].
- Disconnect the electrical connector (P6) [3] from the starter-generator [1].
- Install the caps on the electrical connectors to prevent contamination.

SUBTASK 49-41-21-020-003

(2) Do these steps to disconnect the four terminal lugs [6], [8], [9], [10]:

- Disengage the terminal block cover [12] from the four pins on the starter-generator [1].
- Remove the terminal block cover [12].
- Remove the four nuts [4] from the four terminal studs.
- Disconnect the four terminal lugs (T1) [10], (T2) [9], (T3) [8], and (T4) [6] from the four terminal studs.

**NOTE:** The terminal strip and the fanning strip [7] show the identification of the terminal studs for each of the terminal lugs (T1), (T2), (T3) and (T4).

SUBTASK 49-41-21-020-004

(3) Do these steps to remove the starter-generator [1] from the APU:

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- (a) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203 below the starter-generator [1].
- (b) Loosen seven of the eight nuts [11] that attach the starter-generator [1] to the APU.

NOTE: The starter-generator [1] weighs approximately 55 lb (25 kg).

NOTE: Keep one of the top nuts tight to help you with the removal of the starter-generator [1].

**CAUTION:** MAKE SURE YOU DO THE INSPECTION OF THE STARTER-GENERATOR LIFT FITTING. A DAMAGED LIFT FITTING CAN CAUSE INCORRECT SUPPORT OF THE STARTER-GENERATOR. THIS CAN CAUSE DAMAGE TO THE STARTER-GENERATOR.

- (c) Visually examine the starter-generator lift fitting [14] with a flashlight to make sure there are no signs of cracks or elongations.

**WARNING:** MAKE SURE THE FISHPOLE HOIST IS IN A SERVICEABLE CONDITION. THE CABLE OR CHAIN OF THE FISHPOLE HOIST MUST SHOW NO SIGNS OF DAMAGE. YOU CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

**CAUTION:** FISHPOLE HOISTS WITH A CABLE AND DRUM ASSEMBLY;

MAKE SURE THE CABLE OF THE FISHPOLE HOIST IS EQUALLY WOUND AROUND THE DRUM BEFORE YOU USE THE FISHPOLE HOIST TO HOLD THE STARTER-GENERATOR. A CABLE THAT IS NOT EQUALLY WOUND CAN CAUSE THE STARTER-GENERATOR TO FALL SUDDENLY. THIS CAN CAUSE DAMAGE TO THE STARTER-GENERATOR.

- (d) Install the hoist, COM-1462, chain fishpole hoist, COM-1592 or fishpole hoist, SPL-4157 [13] to the starter-generator [1]:
  - 1) Install the APU generator lifting eye, SPL-1626 [17] to the starter-generator boss [18].
  - 2) Install the fishpole hoist [13] to the starter-generator lift fitting [14].
    - a) Make sure the pin of the fishpole hoist is engaged in the starter-generator lift fitting.
  - 3) Extend the fishpole hoist [13] to a length that is easy to use.
  - 4) Unwind the cable or chain of the fishpole hoist until the clevis fitting [15] is aligned with the APU generator lifting eye, SPL-1626 [17].
  - 5) Install the pin [16] in the clevis fitting [15] and APU generator lifting eye, SPL-1626 [17].
  - 6) Wind and tighten the cable or chain of the fishpole hoist.
- (e) Loosen the last nut [11] that attaches the starter-generator [1] to the APU.
- (f) Turn the starter-generator [1] clockwise until the eight nuts [11] disengage from the eight keyhole slots.

NOTE: It may be necessary to unwind the cable or chain of the fishpole hoist a sufficient amount to turn and move the starter-generator [1] from the drive shaft.

- (g) Slowly move the starter-generator [1] away from the APU about 1.5 in. (38.1 mm) to disengage the drive spline of the starter-generator from the drive shaft.
- (h) Slowly unwind the cable or chain of the fishpole hoist to lower the starter-generator [1] out of the APU compartment.
- (i) Remove the packing [20] from the starter-generator drive spline.
  - 1) Discard the packing [20].
- (j) Install the four nuts [4] on the four terminal studs.

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- (k) Install the terminal block cover [12] on the starter-generator [1]:
  - 1) Put the terminal block cover [12] on the starter-generator [1].
  - 2) Engage the terminal block cover [12] to the four pins on the starter-generator [1].
- (l) Make sure you install all necessary protection covers.
- (m) Remove the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

SUBTASK 49-41-21-080-001

- (4) Remove the hoist, COM-1462, chain fishpole hoist, COM-1592 or fishpole hoist, SPL-4157 [13] from the starter-generator [1]:
  - (a) Remove the pin [16] from the clevis fitting [15] and APU generator lifting eye, SPL-1626 [17].
  - (b) Disconnect the clevis fitting [15] from the APU generator lifting eye, SPL-1626 [17].
  - (c) Remove the APU generator lifting eye, SPL-1626 [17] from the starter-generator boss [18].
  - (d) If you do not install a new starter-generator [1] immediately, remove the fishpole hoist [13]:
    - 1) Wind the cable or chain of the fishpole hoist.
    - 2) Disconnect the pin of the fishpole hoist from the starter-generator lift fitting [14].
    - 3) Remove the fishpole hoist [13].

SUBTASK 49-41-21-020-005

- (5) Do these steps to remove the seal plate [19] for the starter-generator:

**NOTE:** It is necessary to replace the seal plate [19] if you find signs of oil leakage around the starter-generator [1].

- (a) Remove the eight nuts [11] that attach the seal plate [19] to the mounting flange of the starter-generator [1].
- (b) Remove the seal plate [19].

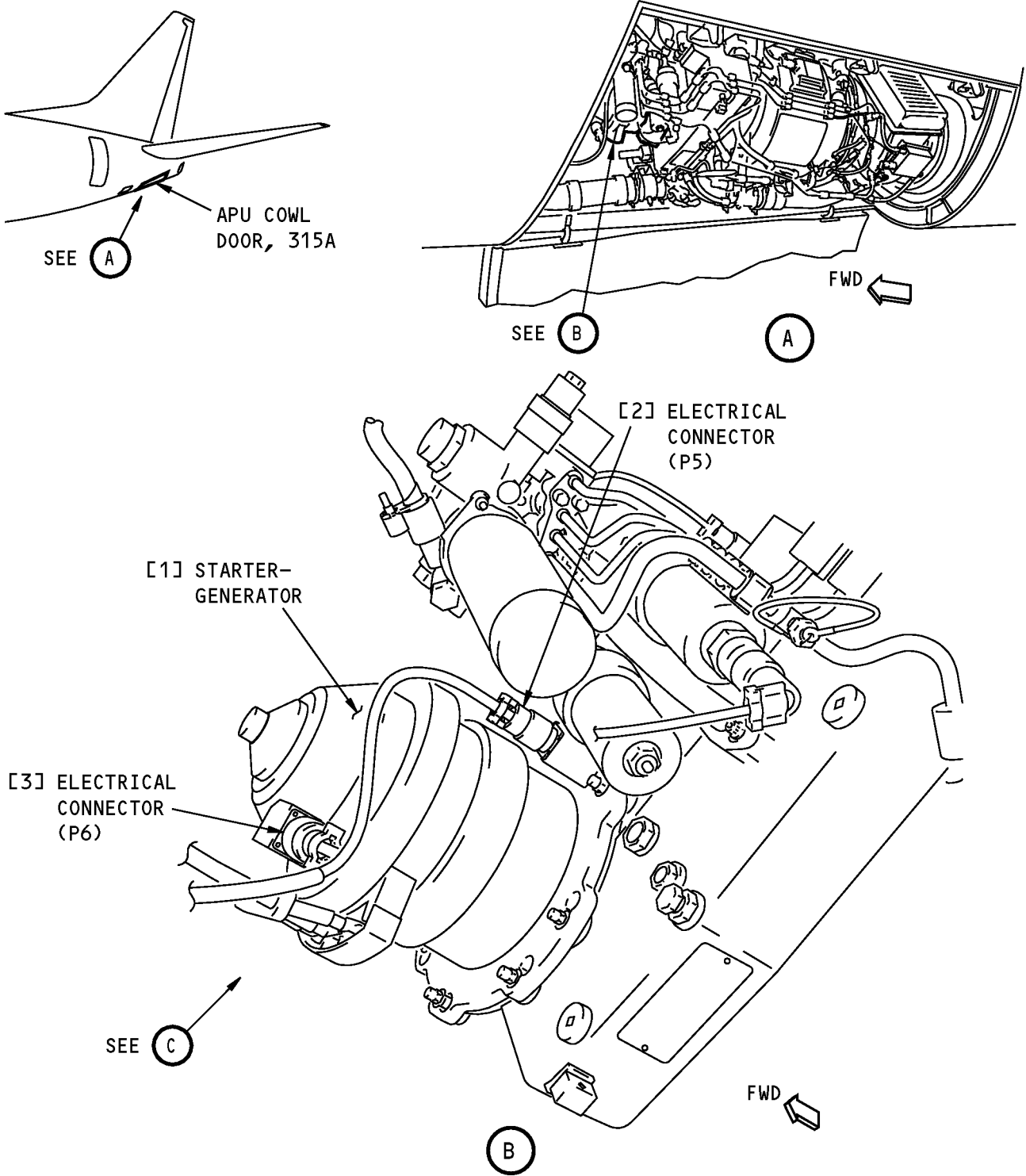
————— **END OF TASK** —————

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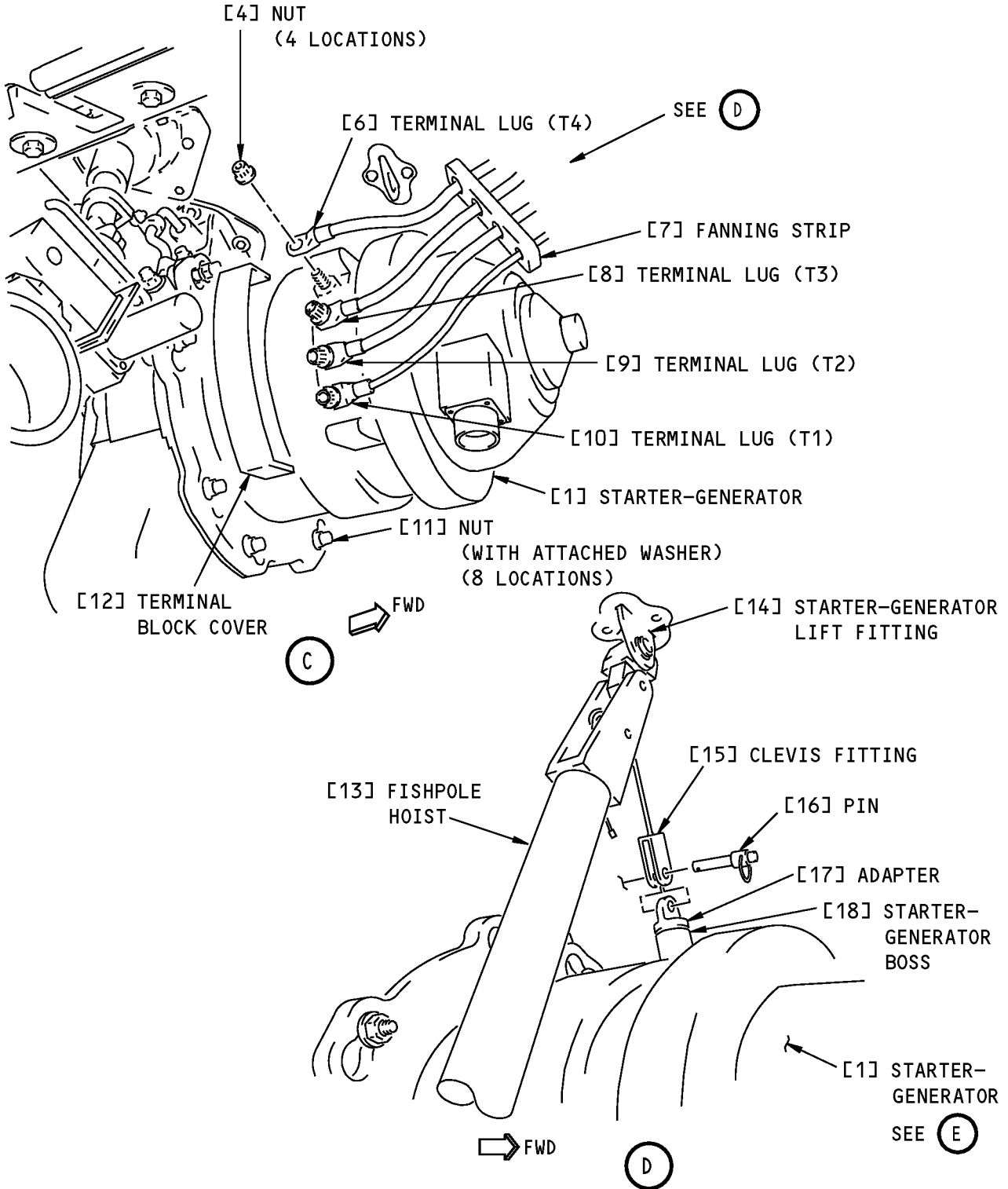


**Starter-Generator Installation**  
**Figure 401 (Sheet 1 of 3)/49-41-21-990-801**

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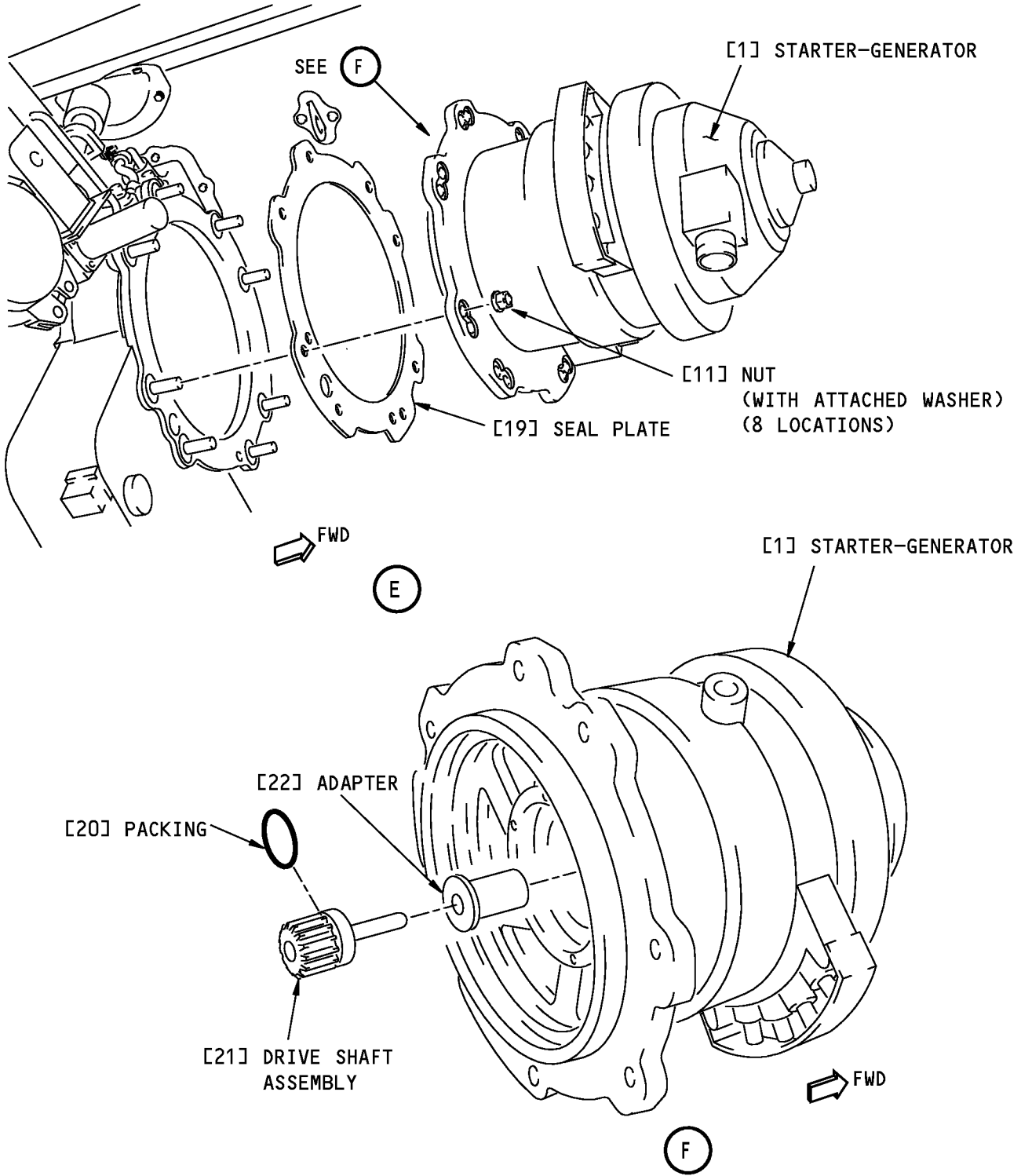
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**Starter-Generator Installation**  
**Figure 401 (Sheet 2 of 3)/49-41-21-990-801**

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**Starter-Generator Installation**  
**Figure 401 (Sheet 3 of 3)/49-41-21-990-801**

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TASK 49-41-21-400-801

3. Starter-Generator Installation

(Figure 401)

A. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-52-13-400-801	Bleed Air Duct Installation (P/B 401)
49-61-00-700-801	APU BITE Procedure (P/B 201)
52-48-21-400-801	Auxiliary Power Unit (APU) Cowl Door Installation (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1462	Hoist - Fishpole (Part #: 10/3641, Supplier: K1425, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -ALL, -BBJ) (Part #: F80039-1, Supplier: 81205, A/P Effectivity: 737-100, -200, -200C, -300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: PF51-003-1, Supplier: 06714, A/P Effectivity: 737-ALL) (Opt Part #: MINILIFT, Supplier: K1425, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -ALL, -BBJ)
COM-1592	Hoist - Fishpole (chain) (Part #: AP6108, Supplier: 4Y309, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -ALL)
SPL-1626	Eye - Lifting, APU Generator (Part #: A49002-2, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-4157	Hoist - Fishpole, 500lb Capacity, 35 Foot Cable, 5 to 9 Foot Adjustable Telescoping Barrel (Part #: PF51-003-1, Supplier: 06714, A/P Effectivity: 737-ALL)
STD-7502	Screwdriver

C. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Starter-generator	49-41-21-01-010	HAP 001-013, 015-026, 028-030
		49-41-21-01-115	HAP 001-013, 015-026, 028-030
		49-41-21-02-015	HAP 031-054, 101-999

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
1 (cont.)		49-41-21-02-135	HAP 031-054, 101-999
19	Seal plate	49-41-21-01-045	HAP 001-013, 015-026, 028-030
20	Packing	49-41-21-02-065 49-41-21-01-042 49-41-21-01-125	HAP 031-054, 101-999 HAP 001-013, 015-026, 028-030 HAP 001-013, 015-026, 028-030
21	Drive Shaft Assembly	49-41-21-02-062 49-41-21-02-145 49-41-21-01-043 49-41-21-01-130	HAP 031-054, 101-999 HAP 031-054, 101-999 HAP 001-013, 015-026, 028-030 HAP 001-013, 015-026, 028-030
22	Adapter	49-41-21-02-063 49-41-21-02-150 49-41-21-01-044 49-41-21-01-135 49-41-21-02-064 49-41-21-02-155	HAP 031-054, 101-999 HAP 031-054, 101-999 HAP 001-013, 015-026, 028-030 HAP 001-013, 015-026, 028-030 HAP 031-054, 101-999 HAP 031-054, 101-999

#### E. Location Zones

Zone	Area
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
315A	APU Cowl Door

#### G. Procedure

SUBTASK 49-41-21-300-001

- (1) If the starter-generator [1] was removed because the starter-generator oil filter was clogged, do these steps:
  - (a) Turn the lock screw inside the Drive Shaft Assembly [21] one half turn counter-clockwise with a screwdriver, STD-7502.
  - (b) Remove the Drive Shaft Assembly [21] and Adapter [22].
  - (c) Visually examine the inside of the rotorshaft for wear and ensure it is free of debris.
  - (d) Install a new Adapter [22] and then a new Drive Shaft Assembly [21].
  - (e) Turn the lock screw inside the Drive Shaft Assembly [21] one half turn clockwise with a screwdriver, STD-7502.
  - (f) Pull on the Drive Shaft Assembly [21] to ensure it is locked in place.

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SUBTASK 49-41-21-420-001

- (2) If the seal plate [19] was removed from the starter-generator [1], install the seal plate:
- Lubricate the packings on the new seal plate [19] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.
  - Install the seal plate [19] on the mounting flange of the starter-generator [1].
  - Loosely install the eight nuts [11].

**NOTE:** A clearance between the seal plate [19] and the eight nuts is necessary to install the eight keyhole slots of the starter-generator [1].

SUBTASK 49-41-21-210-001

**CAUTION:** MAKE SURE YOU DO THE INSPECTION OF THE STARTER-GENERATOR LIFT FITTING. A DAMAGED LIFT FITTING CAN CAUSE INCORRECT SUPPORT OF THE STARTER-GENERATOR. THIS CAN CAUSE DAMAGE TO THE STARTER-GENERATOR.

- (3) Visually examine the starter-generator lift fitting [14] with a flashlight to make sure there are no signs of cracks or elongations.

SUBTASK 49-41-21-480-001

**WARNING:** MAKE SURE THE FISHPOLE HOIST IS IN A SERVICEABLE CONDITION. THE CABLE OR CHAIN OF THE FISHPOLE HOIST MUST SHOW NO SIGNS OF DAMAGE. YOU CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

**CAUTION:** FISHPOLE HOISTS WITH A CABLE AND DRUM ASSEMBLY;

MAKE SURE THE CABLE OF THE FISHPOLE HOIST IS EQUALLY WOUND AROUND THE DRUM BEFORE YOU USE THE FISHPOLE HOIST TO HOLD THE STARTER-GENERATOR. A CABLE THAT IS NOT EQUALLY WOUND CAN CAUSE THE STARTER-GENERATOR TO FALL SUDDENLY. THIS CAN CAUSE DAMAGE TO THE STARTER-GENERATOR.

- (4) Do these steps to install the hoist, COM-1462, chain fishpole hoist, COM-1592 or fishpole hoist, SPL-4157 [13] to the starter-generator [1]:
- Make sure the starter-generator [1] is directly under the starter-generator lift fitting [14].
  - Install the APU generator lifting eye, SPL-1626 [17] in the starter-generator boss [18].
  - Install the fishpole hoist [13] to the starter-generator lift fitting [14].
    - Make sure the pin of the fishpole hoist is engaged in the starter-generator lift fitting.
  - Extend the fishpole hoist [13] to a length that is easy to use.
  - Unwind the cable or chain of the fishpole hoist until the clevis fitting [15] is aligned with the APU generator lifting eye, SPL-1626 [17].
  - Install the pin [16] in the clevis fitting [15] and APU generator lifting eye, SPL-1626 [17].

SUBTASK 49-41-21-420-002

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS IF NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (5) Do these steps to install the starter-generator [1]:
- If the packings on the seal plate [19] are not lubricated, lubricate the packings with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.
  - Lubricate the new packing [20] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.

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- (c) Install the packing [20] on the starter-generator drive spline.
- (d) Disengage the terminal block cover [12] from the four pins on the starter-generator [1].
- (e) Remove the terminal block cover [12].
- (f) Remove the four nuts [4] from the four terminal studs.
- (g) Wind the cable or chain of the fishpole hoist to lift the starter-generator [1] into position.
- (h) Put the starter-generator [1] on the APU.
- (i) Align the eight nuts [11] on the APU with the eight keyhole slots on the starter-generator [1].
- (j) Make sure the starter-generator drive spline engages with the drive shaft.
- (k) Turn the starter-generator [1] counterclockwise until the eight nuts [11] fully engage the eight keyhole slots.
- (l) Tighten one of the eight nuts [11] to 240 in-lb (27.1 N·m).

**NOTE:** The starter-generator [1] weighs approximately 55 lb (25 kg).

- (m) Remove the hoist, COM-1462, chain fishpole hoist, COM-1592 or fishpole hoist, SPL-4157 [13] from the starter-generator [1]:
  - 1) Remove the pin [16] from the clevis fitting [15] and APU generator lifting eye, SPL-1626 [17].
  - 2) Disconnect the clevis fitting [15] from the APU generator lifting eye, SPL-1626 [17].
  - 3) Remove the APU generator lifting eye, SPL-1626 [17] from the starter-generator boss [18].
  - 4) Wind the cable or chain of the fishpole hoist.
  - 5) Disconnect the pin of the fishpole hoist from the starter-generator lift fitting [14].
  - 6) Remove the fishpole hoist [13].
- (n) Tighten the other seven of the eight nuts [11] to 240 in-lb (27.1 N·m).

SUBTASK 49-41-21-420-003

- (6) Do these steps to connect the electrical connectors [2], [3]:
  - (a) Remove the caps from the electrical connectors.
  - (b) Connect the electrical connector (P6) [3] to the starter-generator [1].
  - (c) Connect the electrical connector (P5) [2] to the starter-generator [1].

SUBTASK 49-41-21-420-004

- (7) Do these steps to connect the four terminal lugs [6], [8], [9], [10]:
  - (a) Connect the four terminal lugs (T1) [10], (T2) [9], (T3) [8] and (T4) [6] to the related terminal studs.

**NOTE:** The terminal strip and the fanning strip [7] show the identification of the terminal studs for each of the terminal lugs (T1), (T2), (T3) and (T4).
  - (b) Install the four nuts [4] on the four terminal studs.
    - 1) Tighten the four nuts [4] to 115 in-lb (13.0 N·m)-135 in-lb (15.3 N·m).
  - (c) Install the terminal block cover [12] on the starter-generator [1]:
    - 1) Put the terminal block cover [12] on the starter-generator [1].
    - 2) Engage the terminal block cover [12] to the four pins on the starter-generator [1].

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SUBTASK 49-41-21-860-005

(8) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

SUBTASK 49-41-21-410-002

(9) Close this access door:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 49-41-21-420-005

(10) Do this task: Bleed Air Duct Installation, TASK 49-52-13-400-801.

**H. Starter-Generator Installation Test**

SUBTASK 49-41-21-410-005

(1) Do this task: Auxiliary Power Unit (APU) Cowl Door Installation, TASK 52-48-21-400-801.

**NOTE:** Do not close the APU cowl door at this time. Use the two hold-open rods to hold the APU cowl door open.

SUBTASK 49-41-21-860-002

(2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT
B	14	C01424	AUX POWER UNIT SCU FAN POWER

SUBTASK 49-41-21-860-003

(3) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-41-21-710-001

(4) Do the installation test for the starter-generator:

- (a) Make sure the BUS TRANS switch on the P5 forward overhead panel is in the AUTO position.
- (b) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (c) Operate the APU for a minimum of five minutes.
- (d) During the APU operation, examine the starter-generator for signs of oil leakage.
- (e) If you find oil leakage, do these steps to repair the leakage:
  - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
  - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
  - 3) Repair the cause of the oil leakage.
  - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
  - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

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- 6) During the APU operation, examine the starter-generator for signs of oil leakage.
- 7) If you find oil leakage, do the leakage repair again.
- (f) Make sure the APU GEN OFF BUS light on the P5 forward overhead panel comes on.
- (g) Set the two APU GEN switches on the P5 forward overhead panel to the ON position.  
**NOTE:** One of the two APU GEN switches will connect the APU starter-generator to the two 115V ac transfer busses. It is necessary to set the two APU GEN switches to the ON position for the two SOURCE OFF lights to go off.
- (h) Make sure these lights on the P5 forward overhead panel go off:
  - 1) APU GEN OFF BUS
  - 2) 1 SOURCE OFF
  - 3) 2 SOURCE OFF
  - 4) 1 TRANSFER BUS OFF
  - 5) 2 TRANSFER BUS OFF.
- (i) Set the two APU GEN switches to the OFF position.
- (j) Make sure these lights come on:
  - 1) APU GEN OFF BUS
  - 2) 1 SOURCE OFF
  - 3) 2 SOURCE OFF
  - 4) 1 TRANSFER BUS OFF
  - 5) 2 TRANSFER BUS OFF.
- (k) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
  - 1) If maintenance message(s) show for the APU electrical system or the starter-generator, refer to the applicable Maintenance Message Index in the FIM.
- (l) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

SUBTASK 49-41-21-210-002

- (5) Make sure the APU oil system is full. To check the oil level, do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.

### I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-41-21-410-006

- (1) Close this APU cowl door. To close this APU cowl door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU cowl door.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU cowl door.

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(g) Close the three latches.

————— **END OF TASK** —————

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## IGNITION UNIT - REMOVAL/INSTALLATION

### 1. General

- A. This procedure has these tasks:
  - (1) A removal of the ignition unit
  - (2) An installation of the ignition unit.
- B. The ignition unit is installed on the eductor housing.

#### **TASK 49-41-31-000-801**

### 2. Ignition Unit Removal

(Figure 401)

#### A. General

- (1) The high voltage from the ignition unit must be released before you can remove the ignition unit. To release the high voltage, the electrical connector (P13) must be disconnected from the ignition unit.

#### B. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left

#### C. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

#### D. Prepare for the Removal

SUBTASK 49-41-31-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-41-31-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-41-31-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.

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- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### E. Ignition Unit Removal

SUBTASK 49-41-31-020-001

**WARNING:** DO NOT TOUCH THE IGNITION COMPONENTS UNTIL YOU DO THESE STEPS. THESE STEPS WILL RELEASE THE HIGH VOLTAGE FROM THE IGNITION UNIT. IF YOU DO NOT OBEY THIS PROCEDURE, INJURY TO PERSONS CAN OCCUR.

- (1) Do these steps to release the high voltage from the ignition unit [4]:
  - (a) Make sure five minutes have gone by since the last APU start.
  - (b) Disconnect the electrical connector (P13) [7] from the ignition unit [4].

SUBTASK 49-41-31-020-002

- (2) Do these steps to remove the ignition unit [4]:
  - (a) Disconnect the igniter plug lead [1] from the ignition unit [4].
  - (b) Remove the four bolts [3], [6] and four washers [2], [5] that attach the ignition unit [4] to the bracket.
  - (c) Remove the ignition unit [4].
  - (d) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

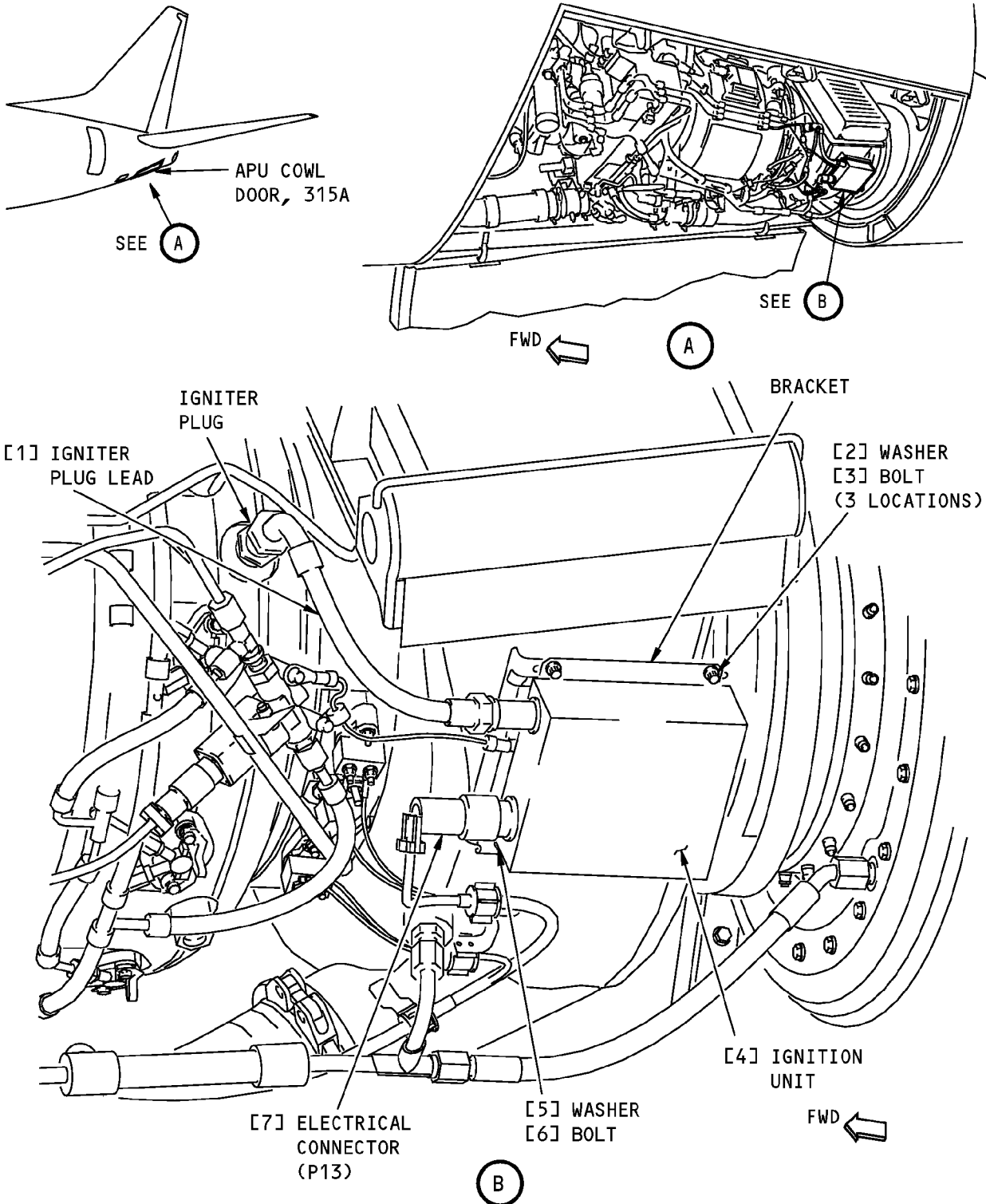
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**Ignition Unit Installation  
Figure 401/49-41-31-990-801**

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#### TASK 49-41-31-400-801

### 3. Ignition Unit Installation

(Figure 401)

#### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

#### B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Igniter plug lead	49-41-52-01-005	HAP 001-013, 015-026, 028-030
4	Ignition unit	49-41-52-02-005	HAP 031-054, 101-999
		49-41-31-01-005	HAP 001-013, 015-026, 028-030
		49-41-31-02-005	HAP 031-054, 101-999

#### C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

#### D. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### E. Procedure

SUBTASK 49-41-31-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the ignition unit [4]:
  - (a) Install the ignition unit [4] on the bracket with the four washers [2], [5] and four bolts [3], [6].
    - 1) Tighten the four bolts [3], [6] to 50 pound-inches (5.7 newton-meters).
  - (b) Connect the igniter plug lead [1] to the ignition unit [4].
    - 1) Tighten the igniter plug lead [1] to 225 pound-inches (25.4 newton-meters).
  - (c) Connect the electrical connector (P13) [7] to the ignition unit [4].

#### F. Ignition Unit Installation Test

SUBTASK 49-41-31-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-41-31-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-41-31-710-001

- (3) Do the installation test for the ignition unit:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

### G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-41-31-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

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# AIRCRAFT MAINTENANCE MANUAL

## IGNITER PLUG - REMOVAL/INSTALLATION

### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
  - (1) A removal of the igniter plug
  - (2) An installation of the igniter plug.
- C. The igniter plug is installed in the combustor housing.

### **TASK 49-41-51-000-801**

### 2. Igniter Plug Removal

(Figure 401)

#### A. General

- (1) This procedure is a scheduled maintenance task.

#### B. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left

#### C. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

#### D. Prepare for the Removal

SUBTASK 49-41-51-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-41-51-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-41-51-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.

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- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### E. Igniter Plug Removal

SUBTASK 49-41-51-020-002

**WARNING:** DO NOT TOUCH THE IGNITION COMPONENTS UNTIL YOU DO THESE STEPS. THESE STEPS WILL RELEASE THE HIGH VOLTAGE FROM THE IGNITION UNIT. IF YOU DO NOT OBEY THIS PROCEDURE, INJURY TO PERSONS CAN OCCUR.

- (1) Do these steps to release the high voltage from the ignition unit and to remove the igniter plug [2]:
  - (a) Make sure five minutes have gone by since the last APU start.

**WARNING:** MAKE SURE YOU DISCONNECT ELECTRICAL CONNECTOR (P13) FROM THE IGNITION UNIT TO RELEASE THE HIGH VOLTAGE. INJURY TO PERSONS CAN OCCUR.

- (b) Disconnect the electrical connector (P13) [4] from the ignition unit.
- (c) Disconnect the igniter plug lead [3] from the ignition unit.
- (d) Remove the igniter plug [2].
- (e) Disconnect the igniter plug lead [3] from the igniter plug [2].
- (f) Remove the gasket [1] from the igniter plug [2].
  - 1) Discard the gasket [1].
- (g) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

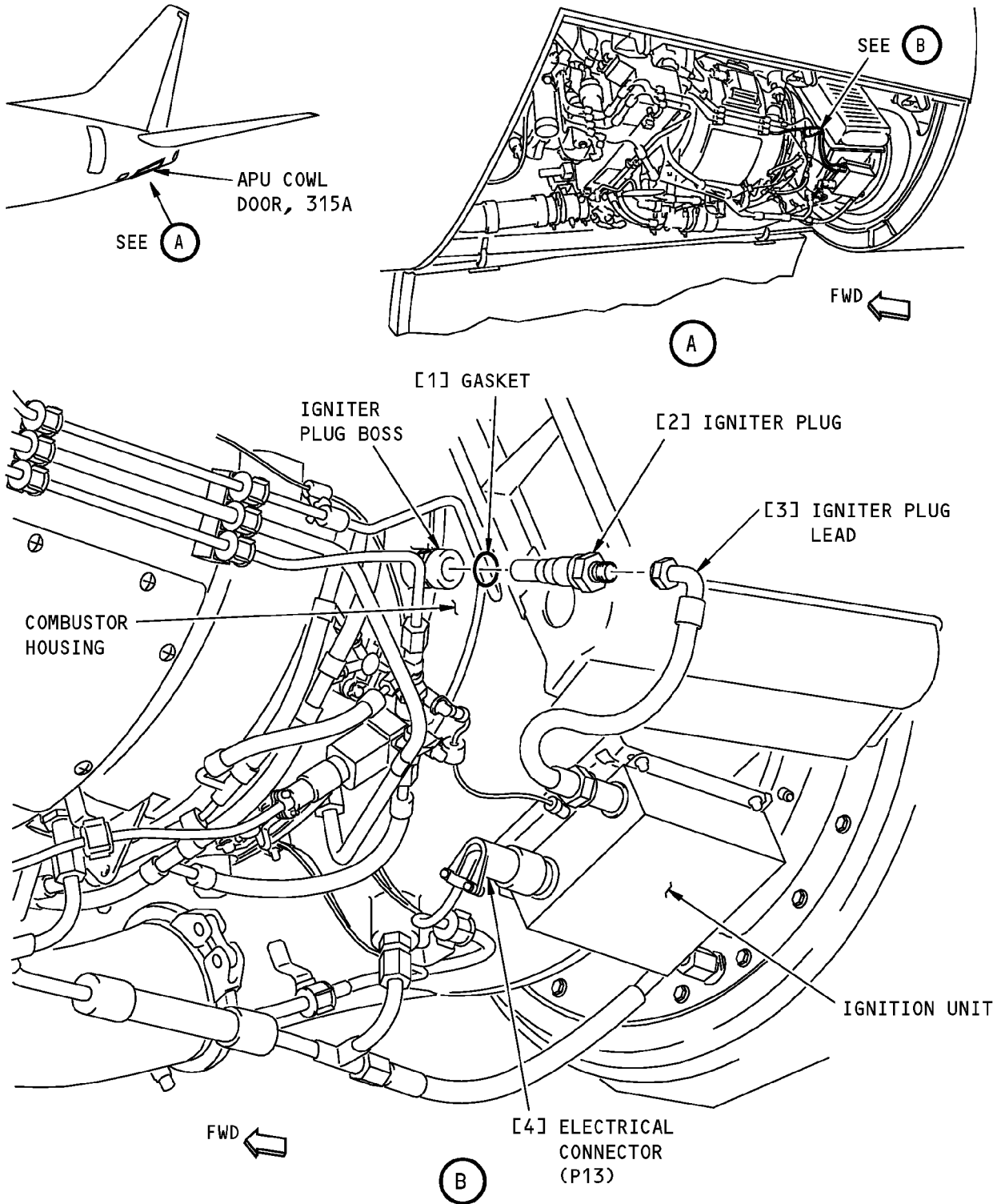
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**Igniter Plug Installation  
Figure 401/49-41-51-990-801**

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#### TASK 49-41-51-400-801

#### 3. Igniter Plug Installation

(Figure 401)

##### A. General

(1) This procedure is a scheduled maintenance task.

##### B. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

##### C. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F

##### D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Gasket	49-41-51-01-010	HAP 001-013, 015-026, 028-030
2	Igniter plug	49-41-51-02-010	HAP 031-054, 101-999
		49-41-51-01-005	HAP 001-013, 015-026, 028-030
3	Igniter plug lead	49-41-51-02-005	HAP 031-054, 101-999
		49-41-52-01-005	HAP 001-013, 015-026, 028-030
		49-41-52-02-005	HAP 031-054, 101-999

##### E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

##### F. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### G. Procedure

SUBTASK 49-41-51-420-002

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the igniter plug [2]:
  - (a) Install the new gasket [1] on the igniter plug [2].
  - (b) Lubricate the igniter plug [2] threads with a light coat of Never-Seez NSBT-8N compound, D00006.
  - (c) Install the igniter plug [2] in the igniter plug boss on the combustor housing.
    - 1) Tighten the igniter plug [2] to 225 pound-inches (25.4 newton-meters).
  - (d) Connect the igniter plug lead [3] to the igniter plug [2].

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- 1) Tighten the igniter plug lead [3] to 225 pound-inches (25.4 newton-meters).
- (e) Connect the igniter plug lead [3] to the ignition unit.
  - 1) Tighten the igniter plug lead [3] to 225 pound-inches (25.4 newton-meters).
- (f) Connect the electrical connector (P13) [4] to the ignition unit.

#### H. Igniter Plug Installation Test

SUBTASK 49-41-51-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-41-51-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-41-51-710-001

- (3) Do the installation test for the igniter plug:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

#### I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-41-51-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

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# AIRCRAFT MAINTENANCE MANUAL

## IGNITER PLUG - INSPECTION/CHECK

### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has the task to inspect the igniter plug.

#### **TASK 49-41-51-200-801**

### 2. Igniter Plug Inspection

(Figure 601)

#### A. General

- (1) This procedure is a scheduled maintenance task.

#### B. References

Reference	Title
49-41-51-000-801	Igniter Plug Removal (P/B 401)
49-41-51-400-801	Igniter Plug Installation (P/B 401)

#### C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

#### D. Procedure

SUBTASK 49-41-51-020-003

- (1) Do this task: Igniter Plug Removal, TASK 49-41-51-000-801.

SUBTASK 49-41-51-210-001

- (2) Inspect the semiconductor (firing tip) for radial cracks and wear.
  - (a) Replace the igniter plug if you find damage on the semiconductor.

SUBTASK 49-41-51-220-001

- (3) Inspect the outer electrode (shell):
  - (a) Measure the inside diameter of the outer electrode.
    - 1) If the diameter is more than 0.335 inch (8.5 mm), replace the igniter plug.
  - (b) Measure the distance from the inside diameter to the outer edge of the outer electrode.
    - 1) If the distance is less than 0.085 inch (2.2 mm), replace the igniter plug.
  - (c) If the inside diameter of the outer electrode shows wear over 90 degrees, replace the igniter plug.
  - (d) Examine the outer electrode that is burned away.
    - 1) If you find the part of the outer electrode that is burned away, replace the igniter plug.

SUBTASK 49-41-51-210-002

- (4) Examine the igniter plug:
  - (a) Shake the igniter plug and listen for noise.
  - (b) Examine the body of the igniter plug for wear that is more than 0.015 inch (0.38 mm).
  - (c) Examine the ceramic insulator for cracks and broken areas.
  - (d) Examine the electrical connector for bent or damaged pin.
  - (e) Examine the inlet and exit holes for contamination and clogged areas.

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(f) If you find any of the above damage or you hear noise, replace the igniter plug.

SUBTASK 49-41-51-420-003

(5) Do this task: Igniter Plug Installation, TASK 49-41-51-400-801.

————— **END OF TASK** —————

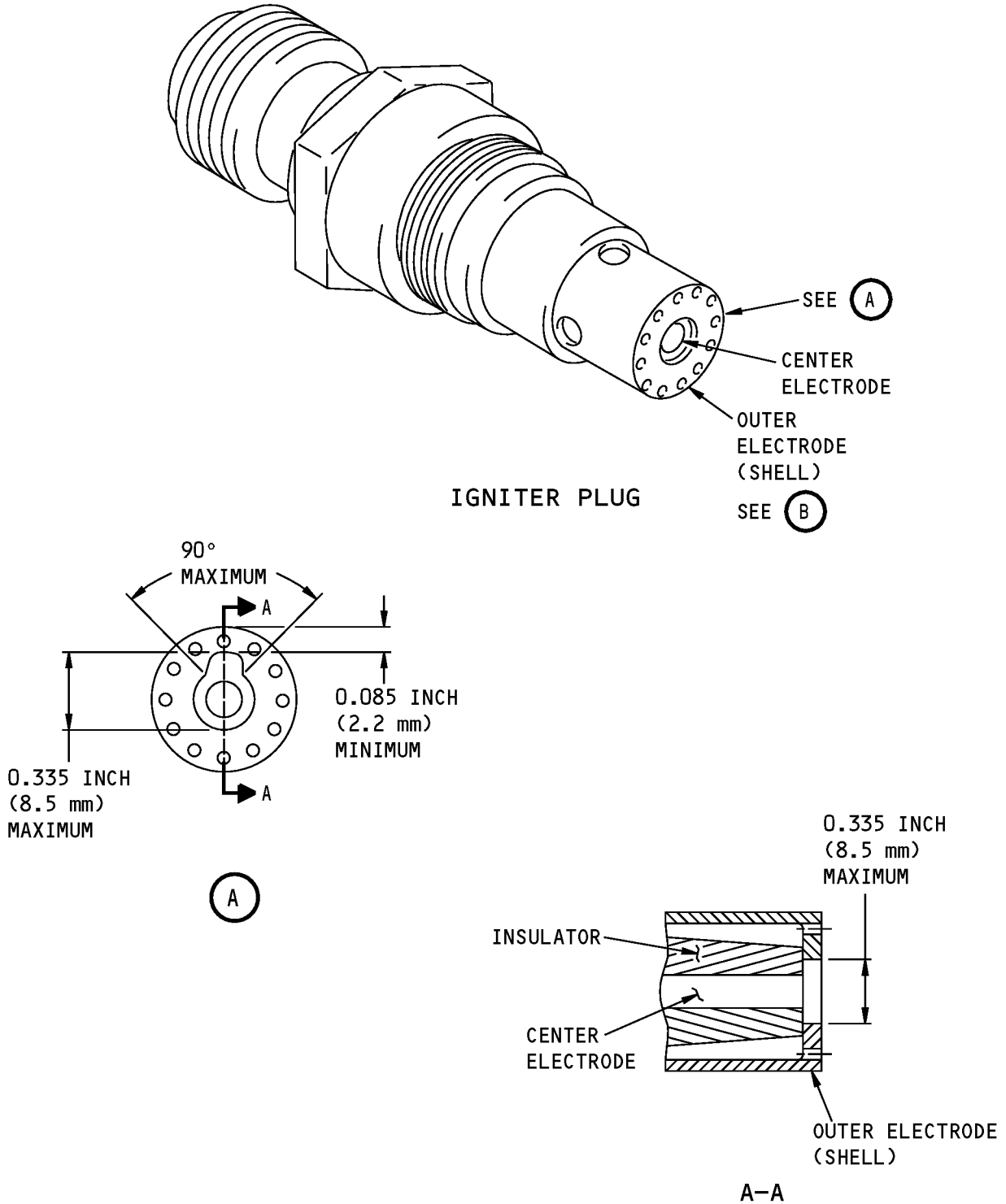
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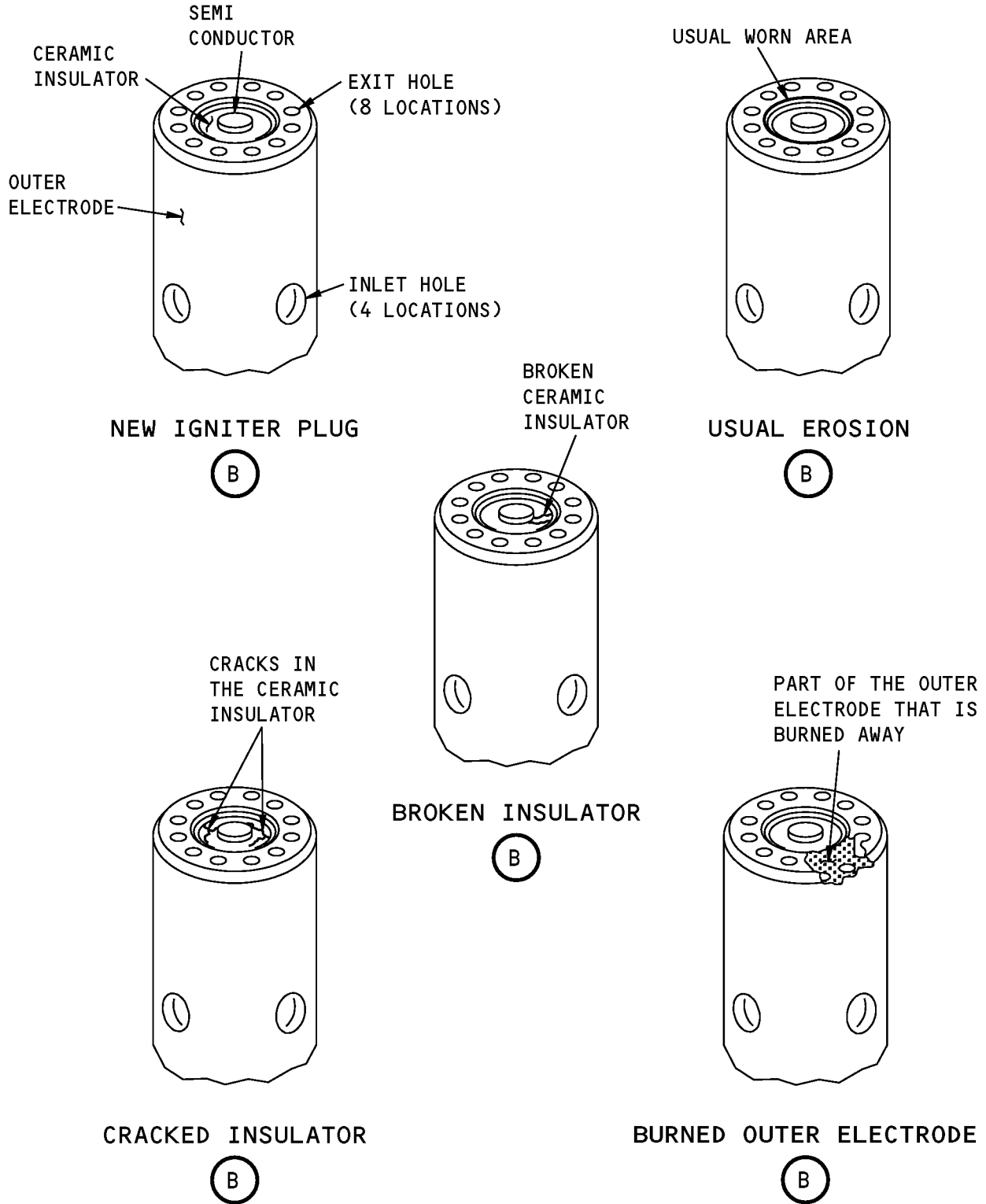




**Igniter Plug Inspection  
Figure 601 (Sheet 1 of 2)/49-41-51-990-802**

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**Igniter Plug Inspection**  
Figure 601 (Sheet 2 of 2)/49-41-51-990-802

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# AIRCRAFT MAINTENANCE MANUAL

## IGNITER PLUG - CLEANING/PAINTING

### 1. General

A. This procedure has the task to clean the igniter plug.

**TASK 49-41-51-100-801**

### 2. Igniter Plug Cleaning

A. References

Reference	Title
49-41-51-000-801	Igniter Plug Removal (P/B 401)
49-41-51-400-801	Igniter Plug Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1236	Brush - Brass Bristles

C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

E. Procedure

SUBTASK 49-41-51-020-001

(1) Do this task: Igniter Plug Removal, TASK 49-41-51-000-801.

SUBTASK 49-41-51-110-001

(2) Do these steps to clean the igniter plug:

- (a) Clean the igniter plug with alcohol, B00130 and a cotton wiper, G00034.
- (b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the igniter plug.

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the igniter plug or to blow away loose material off the igniter plug.

**CAUTION:** DO NOT USE HARD GRIT OR A STEEL BRUSH TO CLEAN THE IGNITER PLUG. DAMAGE TO THE IGNITER PLUG CAN OCCUR.

- (c) Clean all the unwanted materials off the igniter plug with a brass bristles brush, STD-1236.
- (d) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to blow away all the loose material off the igniter plug.

SUBTASK 49-41-51-420-001

(3) Do this task: Igniter Plug Installation, TASK 49-41-51-400-801.

————— **END OF TASK** —————

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## AIRCRAFT MAINTENANCE MANUAL

### IGNITER PLUG LEAD - REMOVAL/INSTALLATION

#### 1. General

A. This procedure has these tasks:

- (1) A removal of the igniter plug lead
- (2) An installation of the igniter plug lead.

B. The igniter plug lead is installed between the ignition unit and the igniter plug.

#### **TASK 49-41-52-000-801**

#### 2. Igniter Plug Lead Removal

(Figure 401)

A. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left

B. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

C. Prepare for the Removal

SUBTASK 49-41-52-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-41-52-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-41-52-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.

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- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### D. Igniter Plug Lead Removal

SUBTASK 49-41-52-020-003

**WARNING:** DO NOT TOUCH THE IGNITION COMPONENTS UNTIL YOU DO THESE STEPS. THESE STEPS WILL RELEASE THE HIGH VOLTAGE FROM THE IGNITION UNIT. IF YOU DO NOT OBEY THIS PROCEDURE, INJURY TO PERSONS CAN OCCUR.

- (1) Do these steps to release the high voltage from the ignition unit and to remove the igniter plug lead [1]:
  - (a) Make sure five minutes have gone by since the last APU start.

**WARNING:** MAKE SURE YOU DISCONNECT ELECTRICAL CONNECTOR (P13) FROM THE IGNITION UNIT TO RELEASE THE HIGH VOLTAGE. INJURY TO PERSONS CAN OCCUR.

- (b) Disconnect the electrical connector (P13) [2] from the ignition unit.
- (c) Disconnect the igniter plug lead [1] from the ignition unit.
- (d) Disconnect the igniter plug lead [1] from the igniter plug.
- (e) Remove the igniter plug lead [1].
- (f) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

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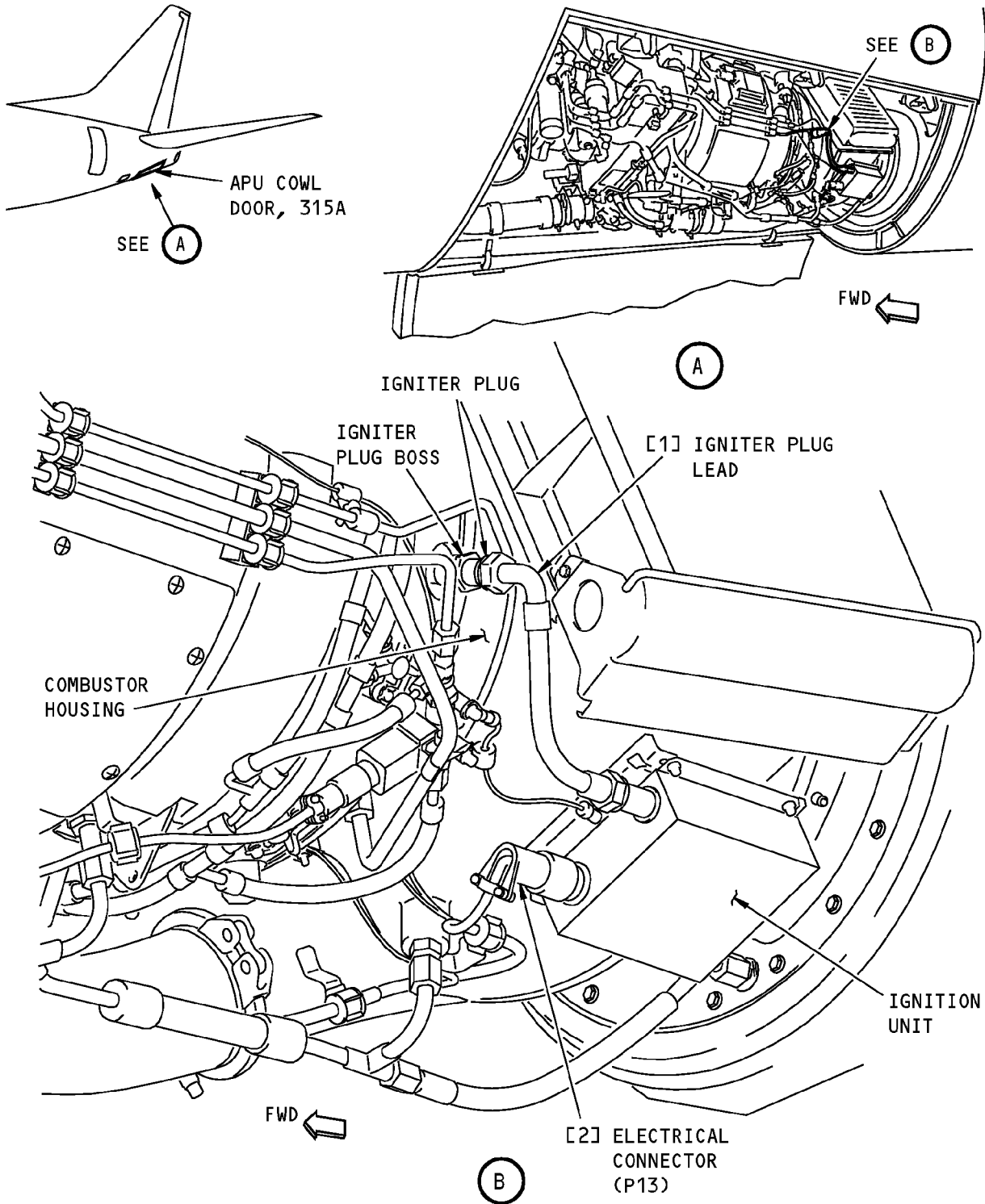
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**Igniter Plug Lead Installation  
Figure 401/49-41-52-990-801**

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#### TASK 49-41-52-400-801

### 3. Igniter Plug Lead Installation

(Figure 401)

#### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

#### B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Igniter plug lead	49-41-52-01-005	HAP 001-013, 015-026, 028-030
		49-41-52-02-005	HAP 031-054, 101-999

#### C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

#### D. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### E. Procedure

SUBTASK 49-41-52-420-003

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the igniter plug lead [1]:
  - (a) Connect the igniter plug lead [1] to the igniter plug.
    - 1) Tighten the igniter plug lead [1] to 225 pound-inches (25.4 newton-meters).
  - (b) Connect the igniter plug lead [1] to the ignition unit.
    - 1) Tighten the igniter plug lead [1] to 225 pound-inches (25.4 newton-meters).
  - (c) Connect the electrical connector (P13) [2] to the ignition unit.

#### F. Igniter Plug Lead Installation Test

SUBTASK 49-41-52-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-41-52-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-41-52-710-001

- (3) Do the installation test for the igniter plug lead:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

### G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-41-52-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (c) Install the retainer pin in the rod end of the forward hold-open rod.
- (d) Install the retainer pin to the spring clip on the aft hold-open rod.
- (e) Close the APU Cowl Door, 315A.
- (f) Disconnect the two hold-open rods from the two brackets.
- (g) Close the three latches.

————— **END OF TASK** —————

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# AIRCRAFT MAINTENANCE MANUAL

## IGNITER PLUG LEAD - INSPECTION/CHECK

### 1. General

A. This procedure has the task to inspect the igniter plug lead.

**TASK 49-41-52-200-801**

### 2. Igniter Plug Lead Inspection

A. References

Reference	Title
49-41-52-000-801	Igniter Plug Lead Removal (P/B 401)
49-41-52-100-801	Igniter Plug Lead Cleaning (P/B 701)
49-41-52-400-801	Igniter Plug Lead Installation (P/B 401)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

C. Procedure

SUBTASK 49-41-52-020-001

(1) Do this task: Igniter Plug Lead Removal, TASK 49-41-52-000-801.

SUBTASK 49-41-52-100-001

(2) If it is necessary, do this task: Igniter Plug Lead Cleaning, TASK 49-41-52-100-801.

SUBTASK 49-41-52-210-001

(3) Do these steps to inspect the igniter plug lead:

- (a) Examine the coupling nut for cracks and corrosion.
- (b) Examine the coupling nut for crossed, stripped and worn threads.
- (c) Examine the teflon or silicone grommet that surrounds the insulator for cracks and distortion.
- (d) Examine the outer shielding of the igniter plug lead for wear.
- (e) Examine the igniter plug lead for cracks and separation between the shielding and the terminal end.
- (f) If you find any of the above damage, replace the igniter plug lead.

SUBTASK 49-41-52-420-001

(4) Do this task: Igniter Plug Lead Installation, TASK 49-41-52-400-801.

**END OF TASK**

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# AIRCRAFT MAINTENANCE MANUAL

## IGNITER PLUG LEAD - CLEANING/PAINTING

### 1. General

A. This procedure has the task to clean the igniter plug lead.

**TASK 49-41-52-100-801**

### 2. Igniter Plug Lead Cleaning

#### A. References

Reference	Title
49-41-52-000-801	Igniter Plug Lead Removal (P/B 401)
49-41-52-400-801	Igniter Plug Lead Installation (P/B 401)

#### B. Tools/Equipment

Reference	Description
STD-123	Brush - Soft Bristle
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

#### C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

#### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

#### E. Procedure

SUBTASK 49-41-52-020-002

(1) Do this task: Igniter Plug Lead Removal, TASK 49-41-52-000-801.

SUBTASK 49-41-52-110-001

(2) Do these steps to clean the igniter plug lead:

- (a) Clean the igniter plug lead with alcohol, B00130 and a cotton wiper, G00034.
- (b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the igniter plug lead.

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the igniter plug lead and to blow away the loose material.

- (c) Clean all the unwanted materials off the connectors for the igniter plug lead with a soft bristle brush, STD-123.
- (d) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to blow away all the loose material off the igniter plug lead.

SUBTASK 49-41-52-420-002

(3) Do this task: Igniter Plug Lead Installation, TASK 49-41-52-400-801.

**END OF TASK**

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# AIRCRAFT MAINTENANCE MANUAL

## START CONVERTER UNIT - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the start converter unit
- (2) An installation of the start converter unit.

B. The start converter unit is installed on the E2-2 electrical shelf. The E2-2 electrical shelf is found in the electrical and electronics compartment (section 43).

### **HAP 001, 002, 006, 007 PRE SB 737-49-1116**

C. You must get access to the three terminal lugs at the rear side of the start converter unit through an access panel in the forward cargo compartment.

### **HAP ALL**

D. The start converter unit is referred to as the SCU.

### **TASK 49-41-61-000-801**

### 2. Start Converter Unit Removal

(Figure 401)

A. References

Reference	Title
20-10-07-000-801	E/E Box Removal (P/B 201)
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)

B. Location Zones

Zone	Area
118	Electrical and Electronics Compartment - Right
<b>HAP 001, 002, 006, 007 PRE SB 737-49-1116</b>	
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right

### **HAP ALL**

211 Flight Compartment - Left

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
821	Forward Cargo Door

D. Prepare for the Removal

SUBTASK 49-41-61-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-41-61-010-002

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

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SUBTASK 49-41-61-860-002

(3) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT
B	14	C01424	AUX POWER UNIT SCU FAN POWER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

**HAP 001, 002, 006, 007 PRE SB 737-49-1116**

SUBTASK 49-41-61-010-003

(4) Open the forward cargo door.

<u>Number</u>	<u>Name/Location</u>
821	Forward Cargo Door

SUBTASK 49-41-61-010-006

(5) Remove the access panel to get access to the rear side of the start converter unit [1].

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E. Procedure

**HAP 001, 002, 006, 007 PRE SB 737-49-1116**

SUBTASK 49-41-61-020-005

**CAUTION:** YOU MUST CAREFULLY DO THE STEPS BELOW TO REMOVE THE START CONVERTER UNIT. A FAILURE TO DO THE STEPS CORRECTLY CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (1) Do these steps to remove the start converter unit [1]:
  - (a) Remove the two screws [7] and two washers [6] from the terminal block cover [5].  
NOTE: You get access to the terminal block cover at the rear side of the start converter unit through an access panel in the forward cargo compartment.
  - (b) Remove the terminal block cover [5].
  - (c) Remove the three nuts [4] and three washers [3] from the three terminal studs.
  - (d) Apply three identification tags to the three terminal lugs [2] for the correct installation to the three terminal studs.
  - (e) Disconnect the three terminal lugs [2] from the three terminal studs.
  - (f) Remove the start converter unit [1]. To remove it, do this task: E/E Box Removal, TASK 20-10-07-000-801.  
NOTE: The weight of the start converter unit [1] is approximately 40 pounds (18 kg).
  - (g) Do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

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HAP 001, 002, 006, 007 PRE SB 737-49-1116 (Continued)

HAP 003-005, 008-013, 015-026, 028-054, 101-999; HAP 001, 002, 006, 007 POST SB 737-49-1116

SUBTASK 49-41-61-020-008

**CAUTION:** YOU MUST CAREFULLY DO THE STEPS BELOW TO REMOVE THE START CONVERTER UNIT. A FAILURE TO DO THE STEPS CORRECTLY CAN CAUSE DAMAGE TO THE EQUIPMENT.

(2) Do these steps to remove the start converter unit [1]:

- (a) Remove the start converter unit [1]. To remove it, do this task: E/E Box Removal, TASK 20-10-07-000-801.

NOTE: The weight of the start converter unit [1] is approximately 40 pounds (18 kg).

- (b) Do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

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————— **END OF TASK** —————

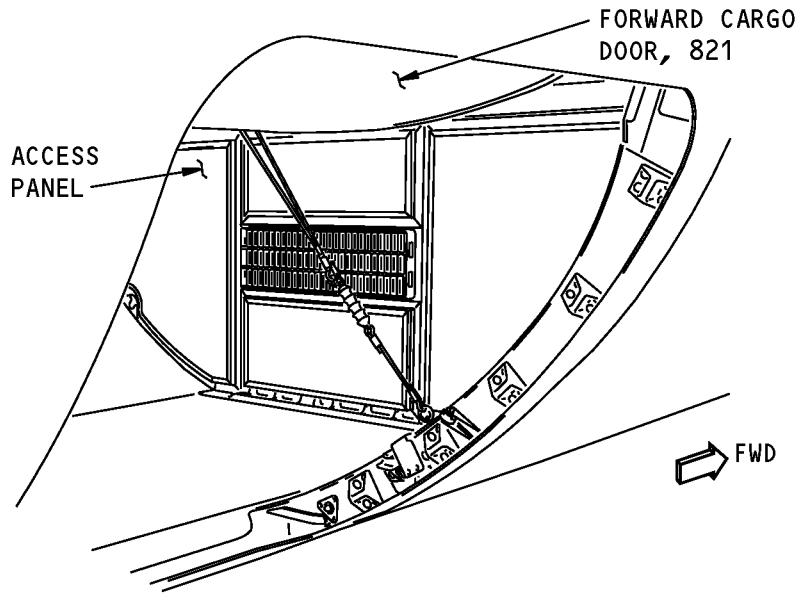
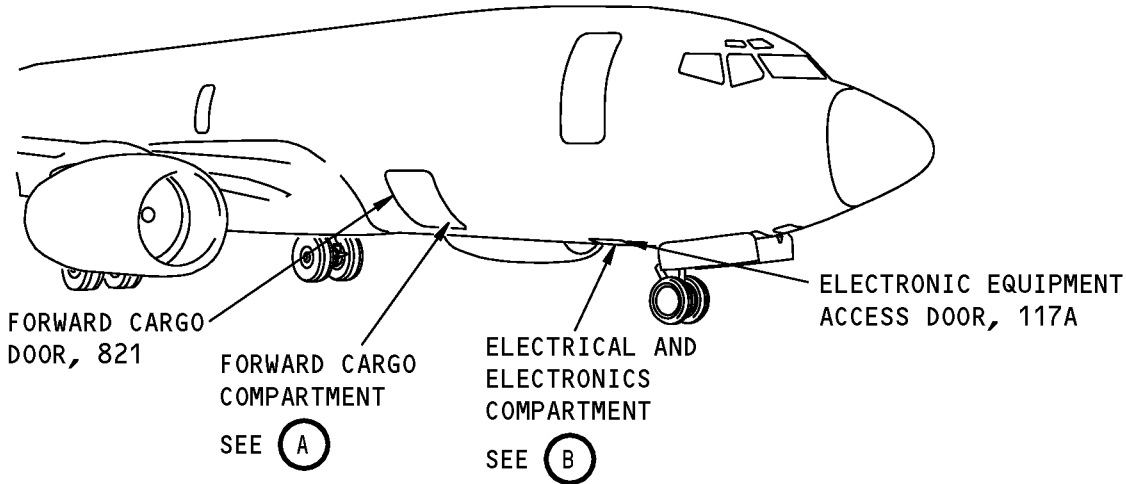
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**FORWARD CARGO COMPARTMENT**

(A)

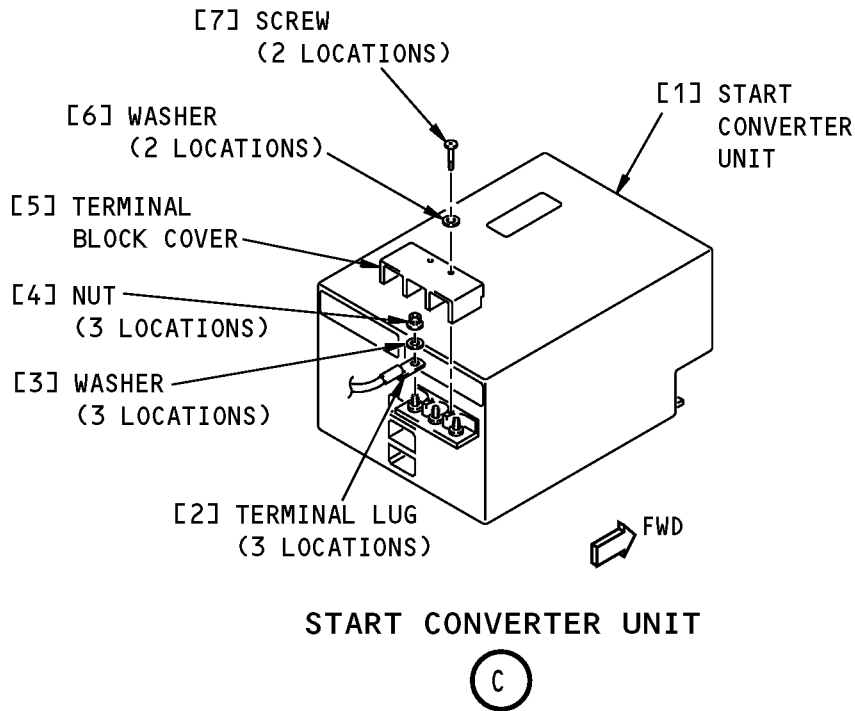
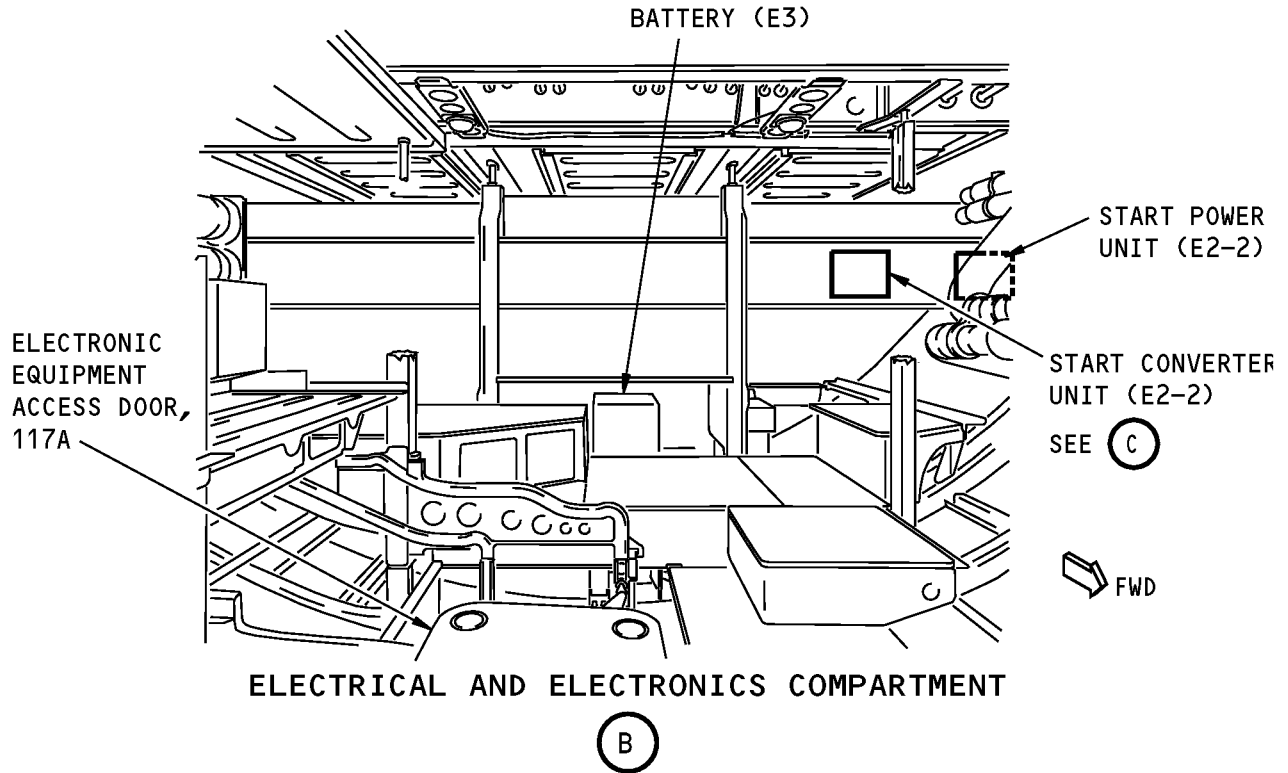
**Start Converter Unit Installation  
Figure 401 (Sheet 1 of 3)/49-41-61-990-801**

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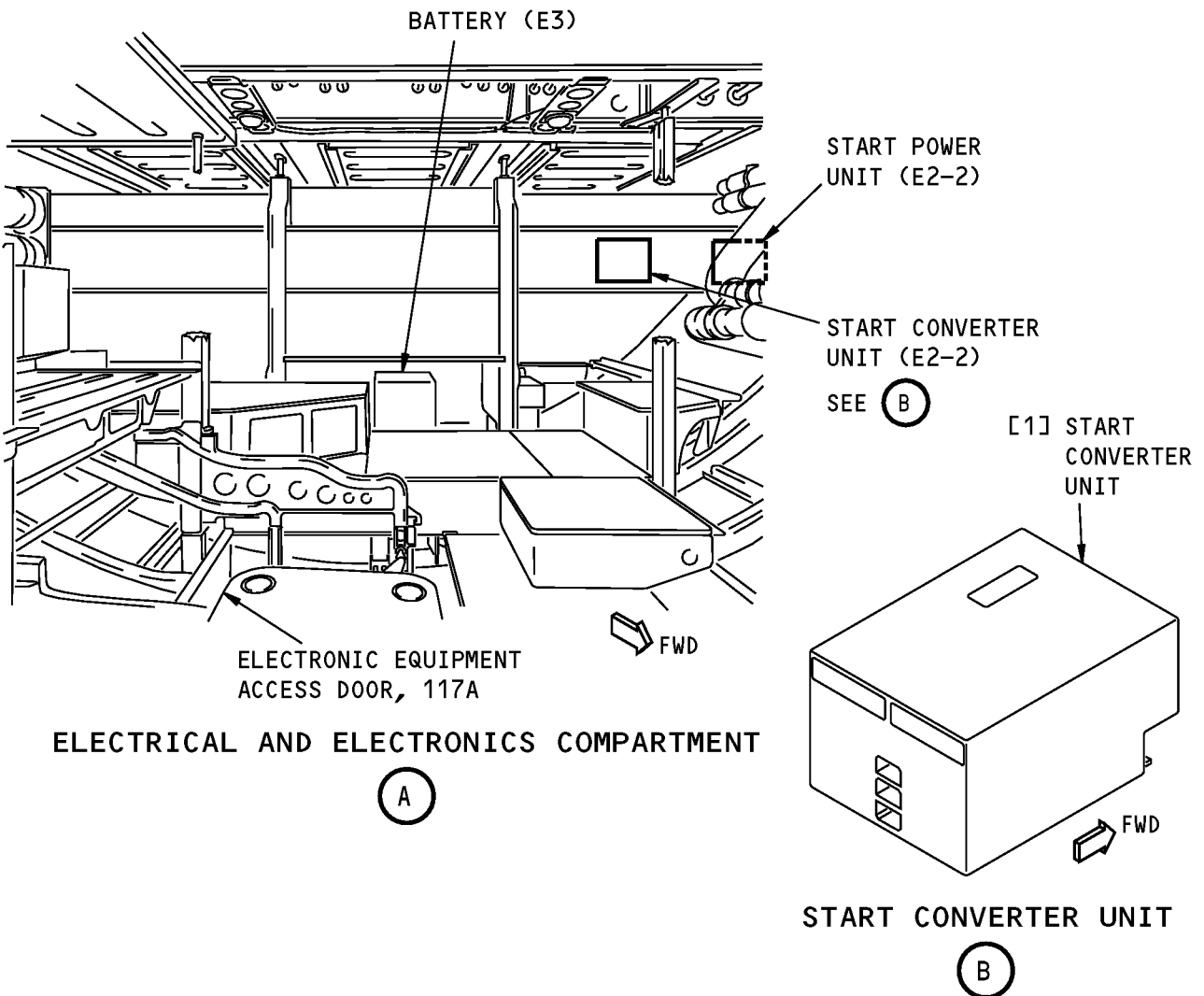
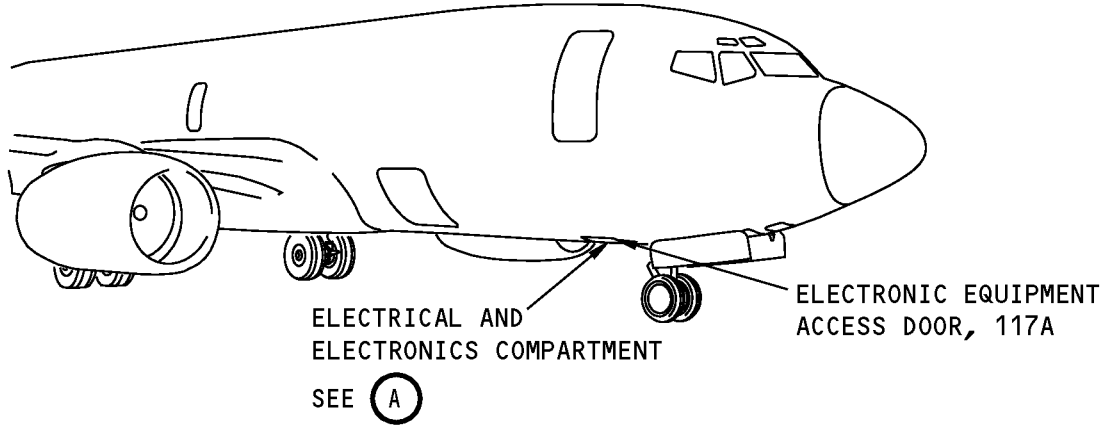
**Start Converter Unit Installation**  
**Figure 401 (Sheet 2 of 3)/49-41-61-990-801**

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**Start Converter Unit Installation  
Figure 401 (Sheet 3 of 3)/49-41-61-990-801**

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HAP 003-005, 008-013, 015-026, 028-054, 101-999; HAP 001, 002, 006, 007 POST SB 737-49-1116

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TASK 49-41-61-400-801

#### 3. Start Converter Unit Installation

(Figure 401)

##### A. References

Reference	Title
20-10-07-400-801	E/E Box Installation (P/B 201)
20-40-12-400-802	ESDS Handling for Metal Encased Unit Installation (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

##### B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Start converter unit	49-41-61-01-005	HAP ALL

##### C. Location Zones

Zone	Area
118	Electrical and Electronics Compartment - Right
<b>HAP 001, 002, 006, 007 PRE SB 737-49-1116</b>	
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right
<b>HAP ALL</b>	
211	Flight Compartment - Left

##### D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
821	Forward Cargo Door

##### E. General

**HAP 001-013, 015-023**

SUBTASK 49-41-61-923-001

- (1) If you replace the start converter unit and the starter-generator rotating diode has failed, a subsequent APU start can cause a failure of the new start converter unit. It is recommended that you replace the starter-generator before you start the APU again.

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##### F. Procedure

**HAP 001, 002, 006, 007 PRE SB 737-49-1116**

SUBTASK 49-41-61-420-005

**CAUTION:** YOU MUST CAREFULLY DO THE STEPS BELOW TO INSTALL THE START CONVERTER UNIT. A FAILURE TO DO THE STEPS CORRECTLY CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (1) Do these steps to install the start converter unit [1]:

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### AIRCRAFT MAINTENANCE MANUAL

HAP 001, 002, 006, 007 PRE SB 737-49-1116 (Continued)

- (a) Install the start converter unit [1]. To install it, do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.

NOTE: The weight of the start converter unit [1] is 40 pounds (18 kg).

- (b) Do this task: E/E Box Installation, TASK 20-10-07-400-801.
- (c) Connect the three terminal lugs [2] to the three terminal studs.
- (d) Install the three washers [3] and three nuts [4] to the three terminal studs.
  - 1) Tighten the three nuts [4] to 95-110 pound-inches (10.7-12.4 newton-meters).
- (e) If it is necessary, remove the three identification tags.
- (f) Install the terminal block cover [5] with the two washers [6] and two screws [7].

**HAP 003-005, 008-013, 015-026, 028-054, 101-999; HAP 001, 002, 006, 007 POST SB 737-49-1116**

SUBTASK 49-41-61-420-006

**CAUTION:** YOU MUST CAREFULLY DO THE STEPS BELOW TO INSTALL THE START CONVERTER UNIT. A FAILURE TO DO THE STEPS CORRECTLY CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (2) Do these steps to install the start converter unit [1]:
    - (a) Install the start converter unit [1]. To install it, do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.
- NOTE: The weight of the start converter unit [1] is 40 pounds (18 kg).
- (b) Do this task: E/E Box Installation, TASK 20-10-07-400-801.

#### HAP ALL

#### G. Start Converter Unit Installation Test

SUBTASK 49-41-61-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT
B	14	C01424	AUX POWER UNIT SCU FAN POWER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

SUBTASK 49-41-61-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-41-61-710-001

- (3) Do the installation test for the start converter unit:
  - (a) Set the BUS TRANS switch on the P5 forward overhead panel to the AUTO position.
  - (b) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (c) Make sure the APU GEN OFF BUS light on the P5 forward overhead panel comes on.

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(d) Set the two APU GEN switches on the P5 forward overhead panel to the ON position.

NOTE: One of the two APU GEN switches will connect the APU starter-generator to the two 115V ac transfer busses. It is necessary to set the two APU GEN switches to the ON position for the two SOURCE OFF lights to go off.

(e) Make sure these lights on the P5 forward overhead panel go off:

- 1) APU GEN OFF BUS
- 2) 1 SOURCE OFF
- 3) 2 SOURCE OFF
- 4) 1 TRANSFER BUS OFF
- 5) 2 TRANSFER BUS OFF

(f) Set the two APU GEN switches to the OFF position.

(g) Make sure these lights come on:

- 1) APU GEN OFF BUS
- 2) 1 SOURCE OFF
- 3) 2 SOURCE OFF
- 4) 1 TRANSFER BUS OFF
- 5) 2 TRANSFER BUS OFF

(h) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

1) If maintenance message(s) show for the APU electrical system, ignition system or the start converter unit, refer to the applicable Maintenance Message Index in the FIM.

(i) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

#### H. Put the Airplane Back to Its Usual Condition

##### HAP 001, 002, 006, 007 PRE SB 737-49-1116

SUBTASK 49-41-61-410-006

(1) Install the access panel that you removed to get access to the rear side of the start converter unit [1].

SUBTASK 49-41-61-410-004

(2) Close the forward cargo door.

<u>Number</u>	<u>Name/Location</u>
821	Forward Cargo Door

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SUBTASK 49-41-61-410-001

(3) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

————— END OF TASK —————

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## START POWER UNIT - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the start power unit
- (2) An installation of the start power unit.

B. The start power unit is installed on the E2-2 electrical shelf. The E2-2 electrical shelf is found in the electrical and electronics compartment (section 43).

C. The start power unit is referred to as the SPU.

### **TASK 49-41-71-000-801**

### 2. Start Power Unit Removal

(Figure 401)

A. References

Reference	Title
20-10-07-000-801	E/E Box Removal (P/B 201)
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)

B. Location Zones

Zone	Area
118	Electrical and Electronics Compartment - Right
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right
211	Flight Compartment - Left

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
821	Forward Cargo Door

D. Prepare for the Removal

SUBTASK 49-41-71-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-41-71-010-001

- (2) Open these access panels:

Number	Name/Location
117A	Electronic Equipment Access Door
821	Forward Cargo Door

SUBTASK 49-41-71-860-002

- (3) Open these circuit breakers and install safety tags:

Battery Shield, J9

Row	Col	Number	Name
A	4	C00142	BATTERY CHARGER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT
B	14	C01424	AUX POWER UNIT SCU FAN POWER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

SUBTASK 49-41-71-010-003

(4) Remove the access panel [1] to get access to the rear side of the battery.

#### E. Procedure

SUBTASK 49-41-71-020-001

**CAUTION:** YOU MUST CAREFULLY DO THE STEPS BELOW TO REMOVE THE START POWER UNIT. A FAILURE TO DO THE STEPS CORRECTLY CAN CAUSE DAMAGE TO THE EQUIPMENT.

(1) Do these steps to remove the start power unit [4]:

(a) Remove the lockwire from the battery connector D44 [3] at the battery [2].

NOTE: You can find the battery on the bottom of the E3 electronic equipment rack. The E3 electronic equipment rack is found in the electrical and electronics compartment (section 43).

**WARNING:** MAKE SURE THE BATTERY CONNECTOR IS ISOLATED FROM THE AIRPLANE STRUCTURE. A BATTERY POWER VOLTAGE OF 28V DC IS PRESENT AT THE BATTERY CONNECTOR. THE ELECTRICAL SHOCK CAN CAUSE INJURY TO PERSONNEL OR CAUSE DAMAGE TO THE AIRPLANE.

(b) Disconnect and isolate the battery connector D44 [3] from the battery [2].

(c) Remove the lockwire from the battery connector D11798 [5] at start power unit [4].

(d) Disconnect the battery connector D11798 [5] from the start power unit [4].

(e) Remove the nut [6], washer [7] and ground wire [8] from the terminal stud.

(f) Remove the start power unit [4]. To remove it, do this task: E/E Box Removal, TASK 20-10-07-000-801.

NOTE: The weight of the start power unit [4] is approximately 40 pounds (18 kg).

(g) Do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

————— **END OF TASK** —————

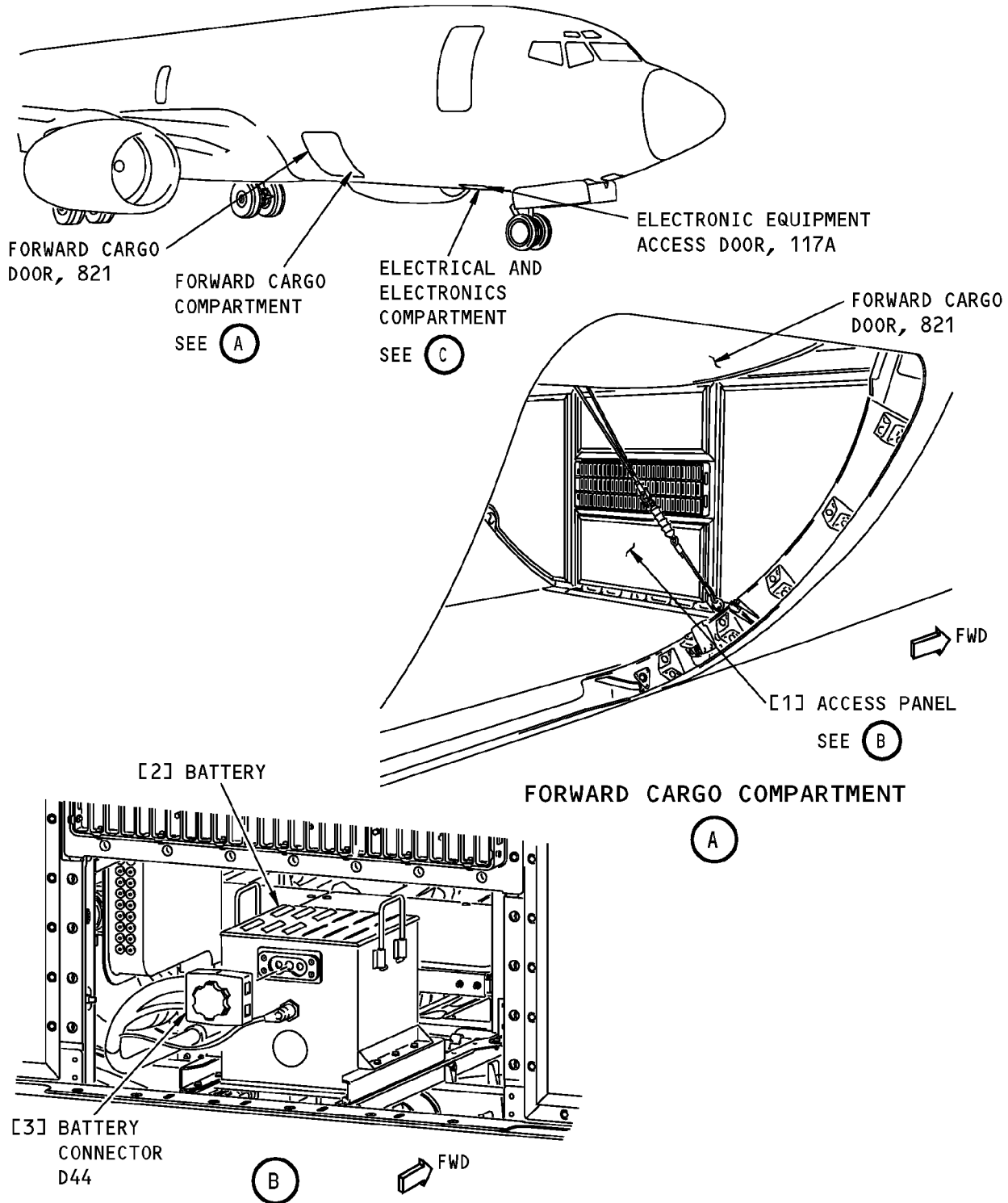
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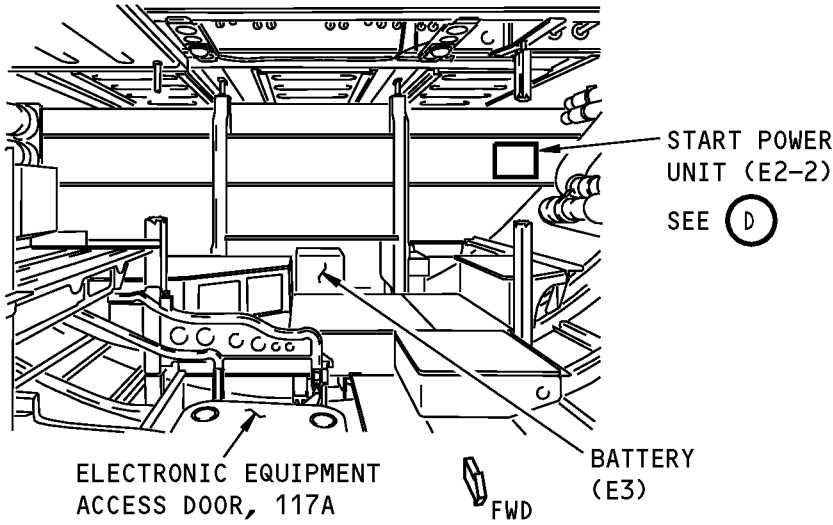


**Start Power Unit Installation  
Figure 401 (Sheet 1 of 3)/49-41-71-990-801**

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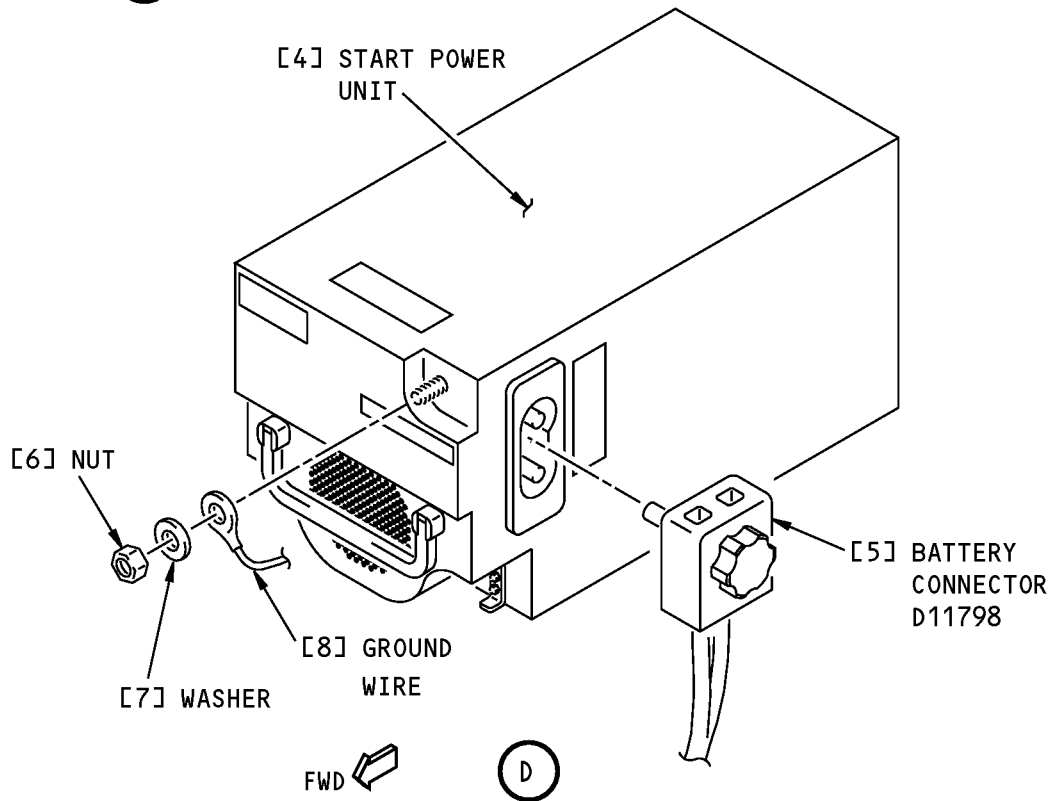
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**ELECTRICAL AND ELECTRONICS  
COMPARTMENT**

(C)

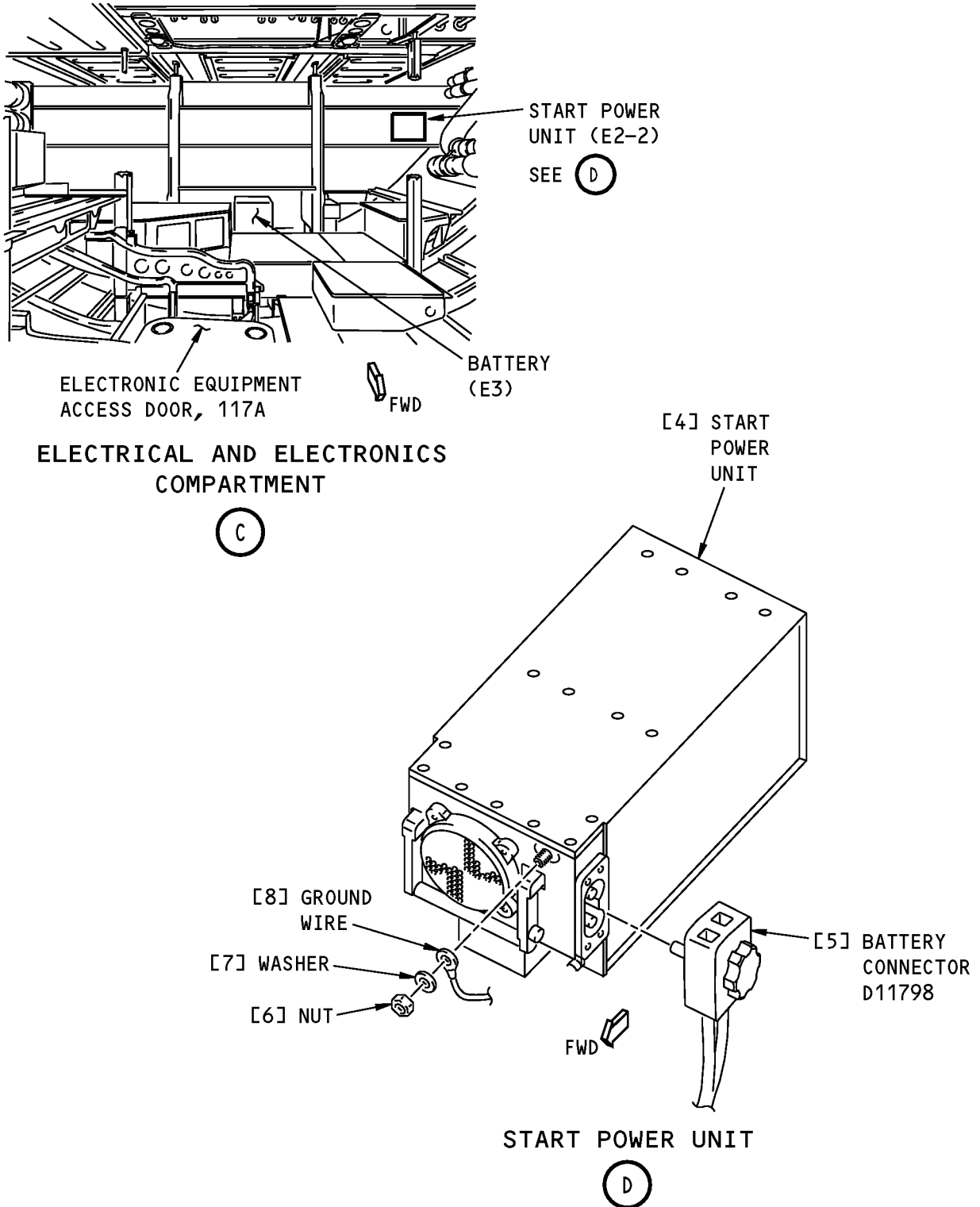


**Start Power Unit Installation  
Figure 401 (Sheet 2 of 3)/49-41-71-990-801**

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HAP 024-026, 028-054, 101-999

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**Start Power Unit Installation  
Figure 401 (Sheet 3 of 3)/49-41-71-990-801**

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HAP 001-013, 015-023

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#### TASK 49-41-71-400-801

### 3. Start Power Unit Installation

(Figure 401)

#### A. References

Reference	Title
20-10-07-400-801	E/E Box Installation (P/B 201)
20-40-12-400-802	ESDS Handling for Metal Encased Unit Installation (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

#### B. Consumable Materials

Reference	Description	Specification
G02166	Lockwire - Nickel-Copper Alloy (Monel)(0.020 inch Diameter)	NASM20995N~C20
G02479	Lockwire - Copper (0.020 inch Diameter)	NASM20995~CY20

#### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Start power unit	49-41-71-01-005	HAP ALL
		49-41-71-01-020	HAP ALL

#### D. Location Zones

Zone	Area
118	Electrical and Electronics Compartment - Right
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right
211	Flight Compartment - Left

#### E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
821	Forward Cargo Door

#### F. Procedure

SUBTASK 49-41-71-420-001

**CAUTION:** YOU MUST CAREFULLY DO THE STEPS BELOW TO INSTALL THE START POWER UNIT. A FAILURE TO DO THE STEPS CORRECTLY CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (1) Do these steps to install the start power unit [4]:
  - (a) Install the start power unit [4]. To install it, do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.
  - NOTE:** The weight of the start power unit [4] is approximately 40 pounds (18 kg).
  - (b) Do this task: E/E Box Installation, TASK 20-10-07-400-801.
  - (c) Install the ground wire [8] on the terminal stud with the washer [7] and nut [6].
    - 1) Tighten the nut [6] to 95-110 inch-pounds (10.7-12.4 newton-meters).

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- (d) Connect the battery connector D11798 [5] to the start power unit [4].
  - 1) Install the lockwire, G02166 on the battery connector D11798 [5].
- (e) Connect the battery connector D44 [3] to the battery [2].
  - 1) Install the lockwire, G02479 on the battery connector D44 [3].

G. Start Power Unit Installation Test

SUBTASK 49-41-71-860-003

- (1) Remove the safety tags and close these circuit breakers:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00142	BATTERY CHARGER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT
B	14	C01424	AUX POWER UNIT SCU FAN POWER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

SUBTASK 49-41-71-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-41-71-710-001

- (3) Do the installation test for the start power unit:
  - (a) Set the BUS TRANS switch on the P5 forward overhead panel to the AUTO position.
  - (b) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (c) Make sure the APU GEN OFF BUS light on the P5 forward overhead panel comes on.
  - (d) Operate the APU for a minimum of five minutes.
  - (e) Set the two APU GEN switches on the P5 forward overhead panel to the ON position.

**NOTE:** One of the two APU GEN switches will connect the APU starter-generator to the two 115V ac transfer busses. It is necessary to set the two APU GEN switches to the ON position for the two SOURCE OFF lights to go off.

- (f) Make sure these lights on the P5 forward overhead panel go off:
  - 1) APU GEN OFF BUS
  - 2) 1 SOURCE OFF
  - 3) 2 SOURCE OFF
  - 4) 1 TRANSFER BUS OFF
  - 5) 2 TRANSFER BUS OFF
- (g) Set the two APU GEN switches to the OFF position.
- (h) Make sure these lights come on:
  - 1) APU GEN OFF BUS
  - 2) 1 SOURCE OFF

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- 3) 2 SOURCE OFF
- 4) 1 TRANSFER BUS OFF
- 5) 2 TRANSFER BUS OFF

(i) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

- 1) If maintenance message(s) show for the APU electrical system, ignition system or the start power unit, refer to the applicable Maintenance Message Index in the FIM.

(j) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

**H. Put the Airplane Back to Its Usual Condition**

SUBTASK 49-41-71-410-002

(1) Install the access panel [1] that you removed to get access to the rear side of the battery.

SUBTASK 49-41-71-410-001

(2) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door
821	Forward Cargo Door

————— **END OF TASK** —————

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### BLEED AIR VALVE - REMOVAL/INSTALLATION

#### 1. General

A. This procedure has these tasks:

- (1) A removal of the bleed air valve
- (2) An installation of the bleed air valve.

B. The bleed air valve is installed between the bleed air duct and the compressor discharge duct. You can get access to the bleed air valve through the APU cowl door.

#### **TASK 49-52-11-000-801**

#### 2. Bleed Air Valve Removal

(Figure 401)

A. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
316	APU Compartment - Right

B. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

C. Prepare for the Removal

SUBTASK 49-52-11-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-52-11-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-11-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.

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- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### D. Bleed Air Valve Removal

SUBTASK 49-52-11-020-001

- (1) Do these steps to remove the bleed air valve [3]:
  - (a) Disconnect the electrical connector (P10) [1] from the bleed air valve [3].
  - (b) Remove the two coupling clamps [2] that hold the bleed air valve [3] to the bleed air duct and compressor discharge duct.
  - (c) Move the bleed air duct forward and up to get access to the bleed air valve [3].
  - (d) Remove the bleed air valve [3].
  - (e) Remove the seals [4] from the bleed air valve [3].
  - (f) Examine the seals [4] for signs of deterioration and leakage.
    - 1) Discard the seals [4] if you find signs of deterioration or leakage.
  - (g) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

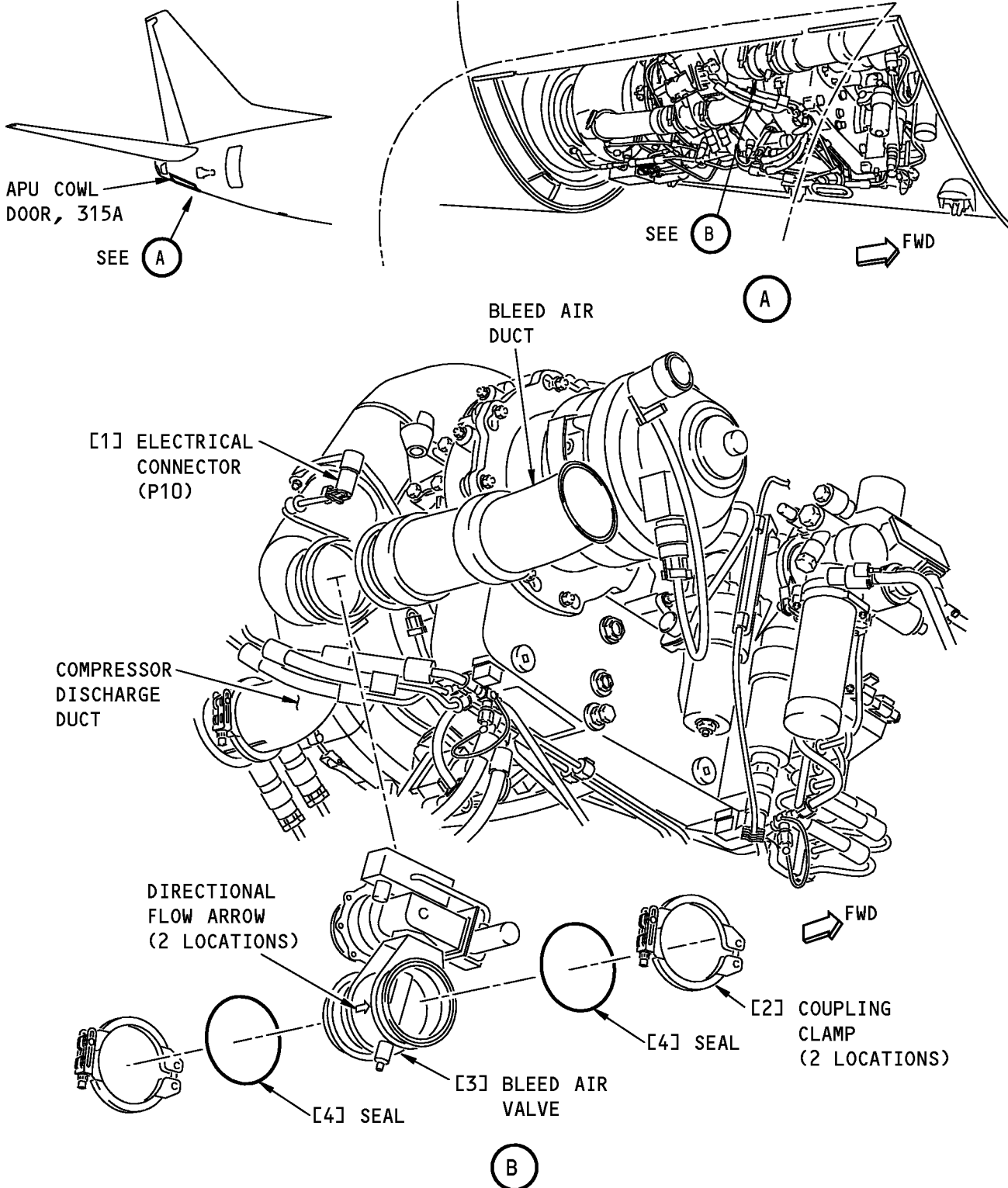
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**Bleed Air Valve Installation  
Figure 401/49-52-11-990-801**

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TASK 49-52-11-400-801

## 3. Bleed Air Valve Installation

(Figure 401)

### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

### B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Bleed air valve	49-52-11-01-005	HAP 001-013, 015-026, 028-036
		49-52-11-01-030	HAP 001-013, 015-026, 028-030
		49-52-11-02-035	HAP 031-054, 101-999
4	Seal	49-52-11-01-010	HAP 001-013, 015-026, 028-030
		49-52-11-02-010	HAP 031-054, 101-999

### C. Location Zones

Zone	Area
211	Flight Compartment - Left
316	APU Compartment - Right

### D. Access Panels

Number	Name/Location
315A	APU Cowl Door

### E. Procedure

SUBTASK 49-52-11-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the bleed air valve [3]:
  - (a) Install the seals [4] on the bleed air valve [3].
  - (b) Put the two coupling clamps [2] on the bleed air duct and compressor discharge duct.
  - (c) Carefully put the bleed air valve [3] in its position on the bleed air duct and compressor discharge duct.

**NOTE:** To install the bleed air valve [3], make sure the directional flow arrow points to the front of the APU.

- 1) Open the two coupling clamps [2] to permit the mark on the bleed air valve [3] to align with the marks on the bleed air duct and compressor discharge duct.
- 2) Make sure the mark on the bleed air valve [3] aligns with the marks on the bleed air duct and compressor discharge duct.
- (d) Put the two coupling clamps [2] over the flanges of the bleed air valve [3], bleed air duct and compressor discharge duct.

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1) Tighten the two coupling clamps [2] to 103 pound-inches (11.6 newton-meters).

(e) Connect the electrical connector (P10) [1] to the bleed air valve [3].

#### F. Bleed Air Valve Installation Test

SUBTASK 49-52-11-860-003

(1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-11-860-004

(2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-52-11-710-001

(3) Do the installation test for the bleed air valve:

(a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

(b) Operate the APU for a minimum of five minutes.

(c) During the APU operation, examine the bleed air valve for signs of air leakage.

(d) If you find air leakage, do these steps to repair the leakage:

1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.

3) Repair the cause of the air leakage.

4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

6) During the APU operation, examine the bleed air valve for signs of air leakage.

7) If you find air leakage, do the leakage repair again.

(e) Set these switches on the P5 forward overhead panel:

1) Set the ISOLATION VALVE switch to the OPEN position.

2) Make sure the engines 1 and/or 2 BLEED switches are in the OFF position.

3) Make sure the L PACK and R PACK switches are in the OFF position.

4) Set the APU BLEED switch to the ON position.

NOTE: The bleed duct pressure must be more than 10 psig.

(f) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

1) If maintenance message(s) show for the APU bleed air system or the bleed air valve, refer to the applicable Maintenance Message Index in the FIM.

(g) Set these switches on the P5 forward overhead panel:

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1) Set the APU BLEED switch to the OFF position.

NOTE: The duct pressure will be 0-6 psig when the bleed switch is in the OFF position, because the bleed air valve is not fully sealed.

2) Set the ISOLATION VALVE switch to the CLOSE position.

(h) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

### G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-11-410-001

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
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315A	APU Cowl Door
------	---------------

(a) Remove the two retainer pins from the two hold-open rods in the APU compartment.

(b) Disconnect the two hold-open rods from the two brackets.

(c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.

(d) Install the retainer pin in the rod end of the forward hold-open rod.

(e) Install the retainer pin to the spring clip on the aft hold-open rod.

(f) Close the APU Cowl Door, 315A.

(g) Close the three latches.

————— **END OF TASK** —————

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# AIRCRAFT MAINTENANCE MANUAL

## INLET GUIDE VANE (IGV) ACTUATOR - REMOVAL/INSTALLATION

### 1. General

- A. This procedure has these tasks:
  - (1) A removal of the inlet guide vane actuator
  - (2) An installation of the inlet guide vane actuator.
- B. The inlet guide vane (IGV) actuator is referred to as the IGV actuator.

#### **TASK 49-52-12-000-801**

### 2. Inlet Guide Vane (IGV) Actuator Removal

(Figure 401)

#### A. Tools/Equipment

Reference	Description
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

#### B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### C. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### D. Prepare for the Removal

SUBTASK 49-52-12-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-52-12-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-12-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.

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- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### E. Inlet Guide Vane (IGV) Actuator Removal

SUBTASK 49-52-12-020-001

- (1) Disconnect the electrical connector (P17) [13] from the IGV actuator [14].

SUBTASK 49-52-12-020-002

- (2) Do these steps to disconnect the supply, return and fuel drain tubes [9], [10], [8] from the IGV actuator [14]:
  - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049 below the IGV actuator [14].

**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Loosen the three bolts [11] that attach the bracket to the IGV actuator [14].
- (c) Disconnect the fuel drain tube [8] from the IGV actuator [14].
- (d) Disconnect the supply and return tubes [9], [10] for the fuel control unit and surge control valve from the IGV actuator [14].
- (e) Remove the two packings [6], two packings [7] and two packings [12] from the three tubes [9], [8], [10].
  - 1) Discard the two packings [6], two packings [7] and two packings [12].
- (f) Drain the fuel from the three tubes [8], [9], [10] into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (g) Install a cap on each of the three tubes [8], [9], [10].

SUBTASK 49-52-12-020-003

- (3) Do these steps to remove the IGV actuator [14]:
  - (a) Loosen the two bolts [2] that attach the cover [1] to the APU.

#### **HAP 001, 006, 007, 031-054, 101-999 PRE SB 131-49-7366**

- (b) Turn the cover [1] clockwise to show the captive bolt [15] for the clevis assembly.

#### **HAP 002-005, 008-013, 015-026, 028-030; HAP 001, 006, 007, 031-054, 101-999 POST SB 131-49-7366**

- (c) Turn the cover [1] clockwise to show the bolt [16] and washer [17] for the clevis assembly.

#### **HAP 001, 006, 007, 031-054, 101-999 PRE SB 131-49-7366**

- (d) Loosen the captive bolt [15] until the rod end [3] of the IGV actuator [14] disengages from the captive bolt.

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HAP 001, 006, 007, 031-054, 101-999 PRE SB 131-49-7366 (Continued)

**HAP 002-005, 008-013, 015-026, 028-030; HAP 001, 006, 007, 031-054, 101-999 POST SB 131-49-7366**

- (e) Remove the bolt [16] and washer [17] that attach the rod end [3] to the clevis assembly.

### HAP ALL

- (f) Remove the three bolts [5] and three washers [4] that attach the IGV actuator [14] to the APU.

**CAUTION:** MAKE SURE THAT THE CLEVIS ASSEMBLY AND CAPTIVE BOLT ARE DISENGAGED FROM THE IGV ACTUATOR. IF YOU REMOVE THE IGV ACTUATOR WITH THE CLEVIS ASSEMBLY AND CAPTIVE BOLT ENGAGED, DAMAGE TO THE CLEVIS ASSEMBLY CAN OCCUR.

- (g) Pull out the IGV actuator [14] slowly.

**HAP 001, 006, 007, 031-054, 101-999 PRE SB 131-49-7366**

- (h) If necessary, disengage the clevis assembly and the captive bolt [15] from the IGV actuator [14].

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- (i) Remove the IGV actuator [14].
- (j) Remove the rod end [3] from the IGV actuator [14].
- (k) Make sure you install all necessary protection covers.
- (l) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

————— **END OF TASK** —————

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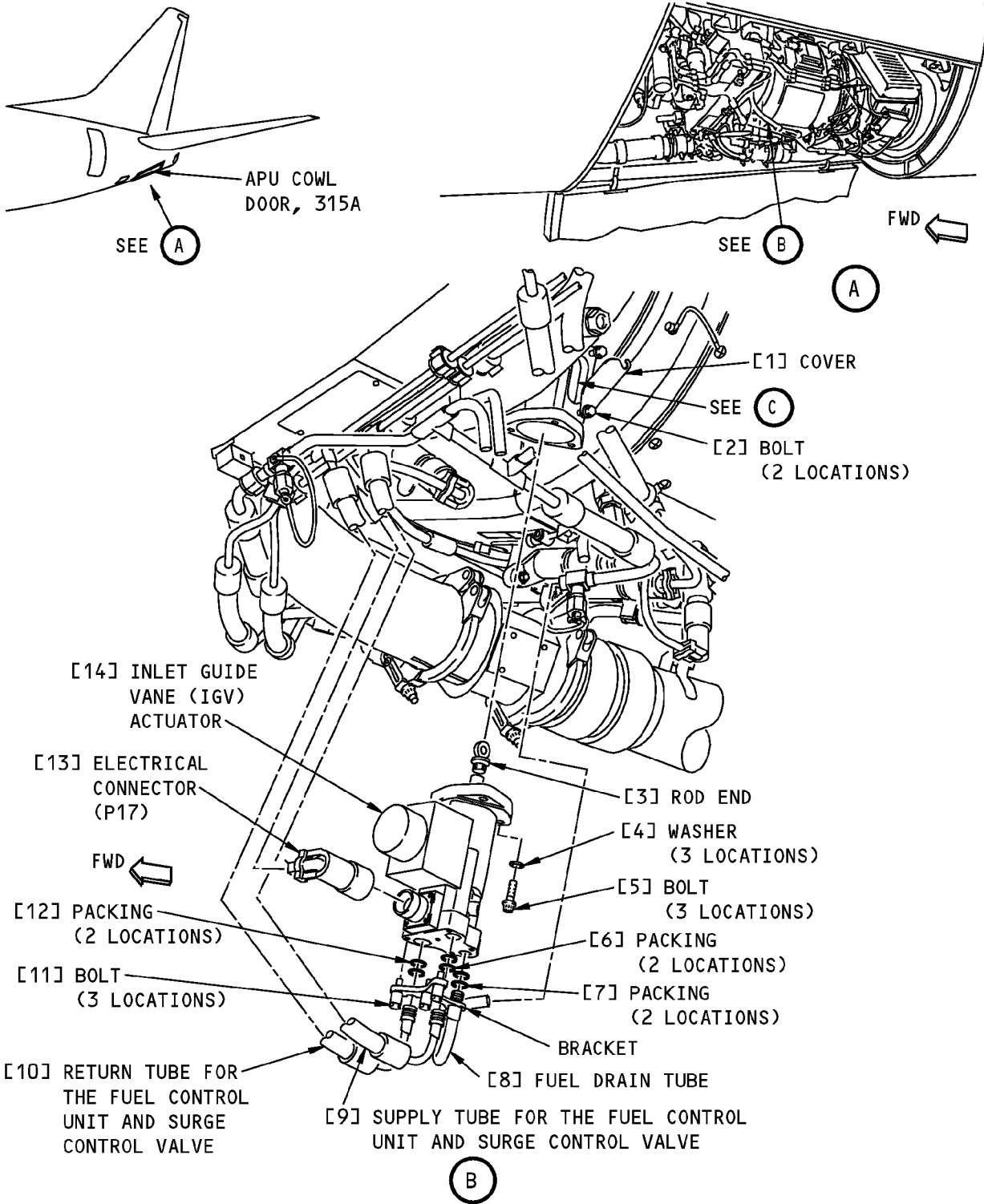
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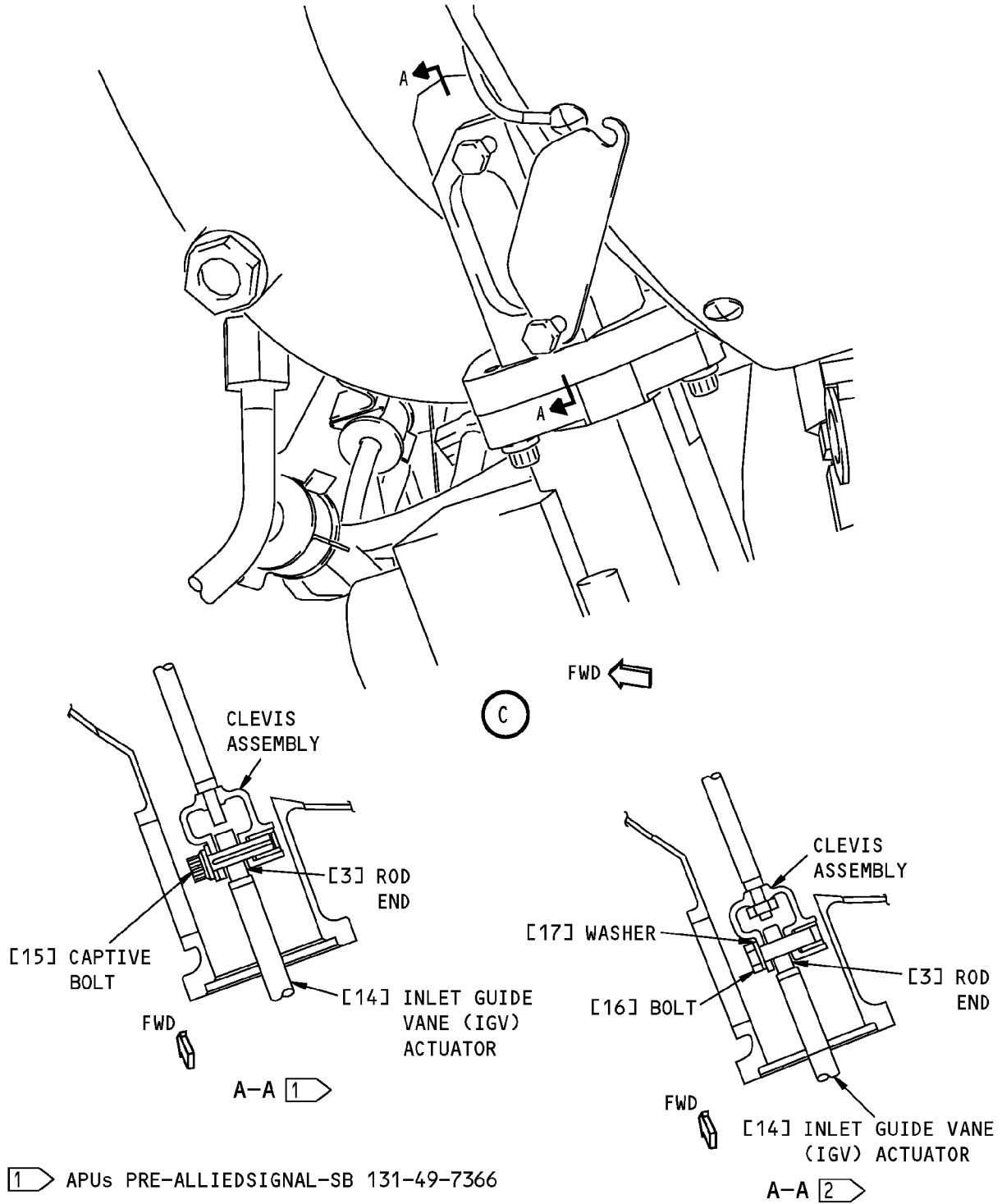
**Inlet Guide Vane Actuator Installation  
Figure 401 (Sheet 1 of 2)/49-52-12-990-801**

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- 1 APUs PRE-ALLIEDSIGNAL-SB 131-49-7366
- 2 APUs POST-ALLIEDSIGNAL-SB 131-49-7366

X3800703MM14

**Inlet Guide Vane Actuator Installation  
Figure 401 (Sheet 2 of 2)/49-52-12-990-801**

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### AIRCRAFT MAINTENANCE MANUAL

TASK 49-52-12-400-801

#### 3. Inlet Guide Vane (IGV) Actuator Installation

(Figure 401)

##### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

##### B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236

##### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Packing	49-52-12-01-030	HAP 001-013, 015-026, 028-030
7	Packing	49-52-12-02-030	HAP 031-054, 101-999
		49-52-12-01-025	HAP 001-013, 015-026, 028-030
12	Packing	49-52-12-02-025	HAP 031-054, 101-999
		49-52-12-01-035	HAP 001-013, 015-026, 028-030
14	IGV actuator	49-52-12-02-035	HAP 031-054, 101-999
		49-52-12-01-015	HAP 001-013, 015-026, 028-030
		49-52-12-02-015	HAP 031-054, 101-999

##### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

##### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### F. Procedure

SUBTASK 49-52-12-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the IGV actuator [14]:
  - (a) Clean the mating surfaces of the IGV actuator [14].
  - (b) Install the rod end [3] on the IGV actuator [14].
    - 1) Tighten the rod end [3] to 30 pound-inches (3.4 newton-meters).

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(c) Put the IGV actuator [14] in its position on the APU.

HAP 001, 006, 007, 031-054, 101-999 PRE SB 131-49-7366

- (d) Align the rod end [3] with the clevis assembly and captive bolt [15].
1) Tighten the captive bolt [15] to 50 pound-inches (5.7 newton-meters).

HAP 002-005, 008-013, 015-026, 028-030; HAP 001, 006, 007, 031-054, 101-999 POST SB 131-49-7366

- (e) Align the rod end [3] with the clevis assembly and install the washer [17] and bolt [16].
1) Tighten the bolt [16] to 50 pound-inches (5.7 newton-meters).

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- (f) Install the three bolts [5] and three washers [4] that attach the IGV actuator [14] to the APU.
1) Tighten the three bolts [5] to 120 pound-inches (13.6 newton-meters).
(g) Turn the cover [1] counterclockwise until the flange fully engages the top bolt.
1) Tighten the two bolts [2] to 50 pound-inches (5.7 newton-meters).

SUBTASK 49-52-12-420-002

- (2) Do these steps to connect the supply, return and fuel drain tubes [9], [10], [8] to the IGV actuator [14]:
(a) Lubricate the two new packings [6] and two new packings [12] for the supply and return tubes for the fuel control unit and surge control valve with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.
(b) Lubricate the two new packings [7] for the fuel drain tube with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.
(c) Remove the three caps from the three tubes [8], [9], [10].
(d) Install the two packings [6] and two packings [12] on the supply and return tubes [9], [10] for the fuel control unit and surge control valve.
(e) Install the two packings [7] on the fuel drain tube [8].
(f) Connect the three tubes [8], [9], [10] with the bracket to the IGV actuator [14].
(g) Tighten the three bolts [11] that attach the bracket to the IGV actuator [14] to 50 pound-inches (5.7 newton-meters).

SUBTASK 49-52-12-420-003

- (3) Connect the electrical connector (P17) [13] to the IGV actuator [14].

G. Inlet Guide Vane (IGV) Actuator Installation Test

SUBTASK 49-52-12-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Table with 4 columns: Row, Col, Number, Name. Row B, Col 19, Number C01344, Name APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Table with 4 columns: Row, Col, Number, Name. Row A, Col 14, Number C00033, Name AUX POWER UNIT CONT

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SUBTASK 49-52-12-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-52-12-710-001

- (3) Do the installation test for the IGV actuator:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Operate the APU for a minimum of five minutes.
  - (c) During the APU operation, examine the IGV actuator for signs of fuel leakage.

NOTE: A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted during an APU operation from the forward drain on the APU drain seal.
  - (d) If you find more than the fuel leakage rate, then do these steps to repair the leakage:
    - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
    - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
    - 3) Repair the cause of the fuel leakage.
    - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
    - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
    - 6) During the APU operation, examine the IGV actuator for signs of fuel leakage.
    - 7) If you find more than the fuel leakage rate, then do the leakage repair again.
  - (e) Set these switches on the P5 forward overhead panel:
    - 1) Set the ISOLATION VALVE switch to the OPEN position.
    - 2) Make sure the engines 1 and/or 2 BLEED switches are in the OFF position.
    - 3) Make sure the L PACK and R PACK switches are in the OFF position.
    - 4) Set the APU BLEED switch to the ON position.

NOTE: The bleed duct pressure must be more than 10 psig.
  - (f) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
    - 1) If maintenance message(s) show for the APU bleed air system or the IGV actuator, refer to the applicable Maintenance Message Index in the FIM.
  - (g) Set these switches on the P5 forward overhead panel:
    - 1) Set the APU BLEED switch to the OFF position.
    - 2) Set the ISOLATION VALVE switch to the CLOSE position.
  - (h) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-12-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.

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- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

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## INLET GUIDE VANE (IGV) ACTUATOR - ADJUSTMENT/TEST

### 1. General

- A. This procedure has the task to do the operational test for the inlet guide vane actuator.
- B. The inlet guide vane (IGV) actuator is referred to as the IGV actuator.

#### **TASK 49-52-12-710-801**

### 2. Inlet Guide Vane (IGV) Actuator Operational Test

(Figure 501)

#### A. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Inlet guide vane actuator	49-52-12-01-015	HAP 001-013, 015-026, 028-030
		49-52-12-02-015	HAP 031-054, 101-999

#### B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### C. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### D. Prepare for the Operational Test

SUBTASK 49-52-12-860-005

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-52-12-860-006

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-12-010-002

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.

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- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

SUBTASK 49-52-12-010-003

- (4) Do these steps to remove the access door for the compressor inlet plenum [1]:
  - (a) Loosen the eight captive screws [2] that attach the access door [1] to the compressor inlet plenum.
  - (b) Remove the access door [1] from the compressor inlet plenum.

NOTE: A lanyard is attached to the access door to keep the access door with the APU.

### E. Procedure

SUBTASK 49-52-12-860-007

- (1) Do the operational test for the inlet guide vane actuator [3]:
  - (a) Loosen the two bolts [5] that attach the cover [4] to the APU.
  - (b) Turn the cover [4] clockwise to show the inlet guide vanes.
  - (c) Remove the three bolts [7] and three washers [6] that attach the inlet guide vane actuator [3] to the APU.
  - (d) While you pull the inlet guide vane actuator [3] down approximately one inch (25.4 mm), make sure the inlet guide vanes move smoothly.

NOTE: You can see the movement of the inlet guide vanes through the access door for the compressor inlet plenum and through the cover for the IGV actuator with a flashlight.

NOTE: The force necessary to pull the inlet guide vane actuator [3] down is approximately 6-10 pounds (26.7-44.5 newtons).

- (e) Put the inlet guide vane actuator [3] in its position on the APU.
- (f) Install the three washers [6] and three bolts [7] that attach the inlet guide vane actuator [3] to the APU.
  - 1) Tighten the three bolts [7] to 120 pound-inches (13.6 newton-meters).
- (g) Turn the cover [4] counterclockwise until the flange fully engages the top bolt.
  - 1) Tighten the two bolts [5] to 50 pound-inches (5.7 newton-meters).

### F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-12-410-002

- (1) Install the access door [1] to the compressor inlet plenum with the eight captive screws [2].

SUBTASK 49-52-12-410-003

- (2) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.

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- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

SUBTASK 49-52-12-860-008

(3) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-12-860-009

(4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

————— **END OF TASK** —————

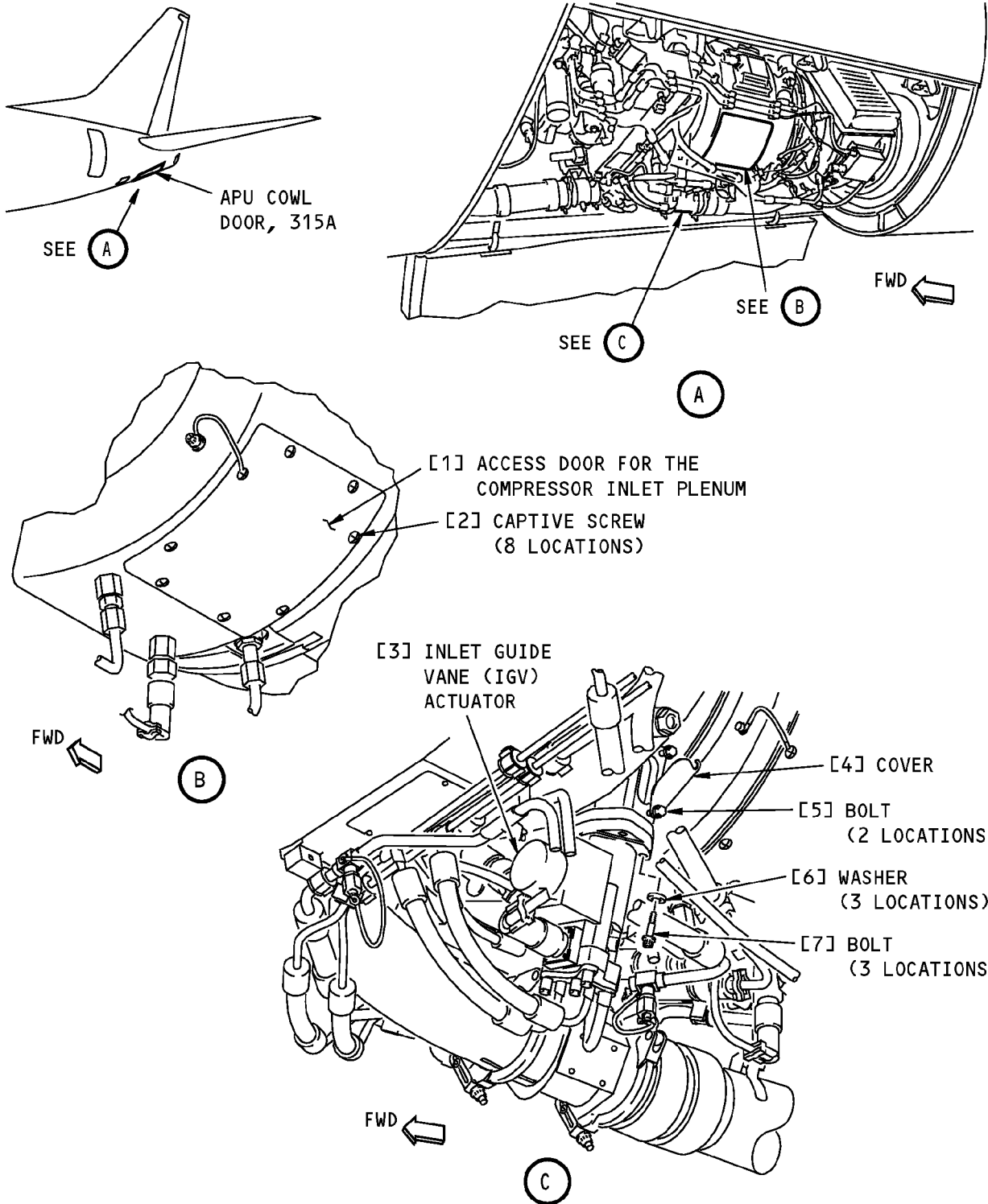
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**Inlet Guide Vane Actuator Test  
Figure 501/49-52-12-990-802**

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### BLEED AIR DUCT - REMOVAL/INSTALLATION

#### 1. General

A. This procedure has these tasks:

- (1) A removal of the bleed air duct
- (2) An installation of the bleed air duct.

B. The bleed air duct is installed between the bleed air valve and bleed duct assembly.

#### **TASK 49-52-13-000-801**

#### 2. Bleed Air Duct Removal

(Figure 401)

A. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
316	APU Compartment - Right

B. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

C. Prepare for the Removal

SUBTASK 49-52-13-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-52-13-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-13-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.

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- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### D. Bleed Air Duct Removal

SUBTASK 49-52-13-020-001

- (1) Do these steps to remove the bleed air duct [3]:
  - (a) Remove the two coupling clamps [1] that attach the bleed air duct [3] to the bleed air valve and bleed duct assembly.

NOTE: The bleed duct assembly extends through the 1088 bulkhead.

- (b) Remove the bleed air duct [3].

**CAUTION:** BE CAREFUL WHEN YOU REMOVE THE TWO SEALS FROM THE BLEED AIR DUCT. DAMAGE TO THE SEALS CAN OCCUR.

- (c) Carefully remove the two seals [2] from the bleed air duct [3].
- (d) Examine the two seals [2] for signs of deterioration and leakage.
  - 1) Discard the two seals [2] if you find signs of deterioration or leakage.
- (e) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

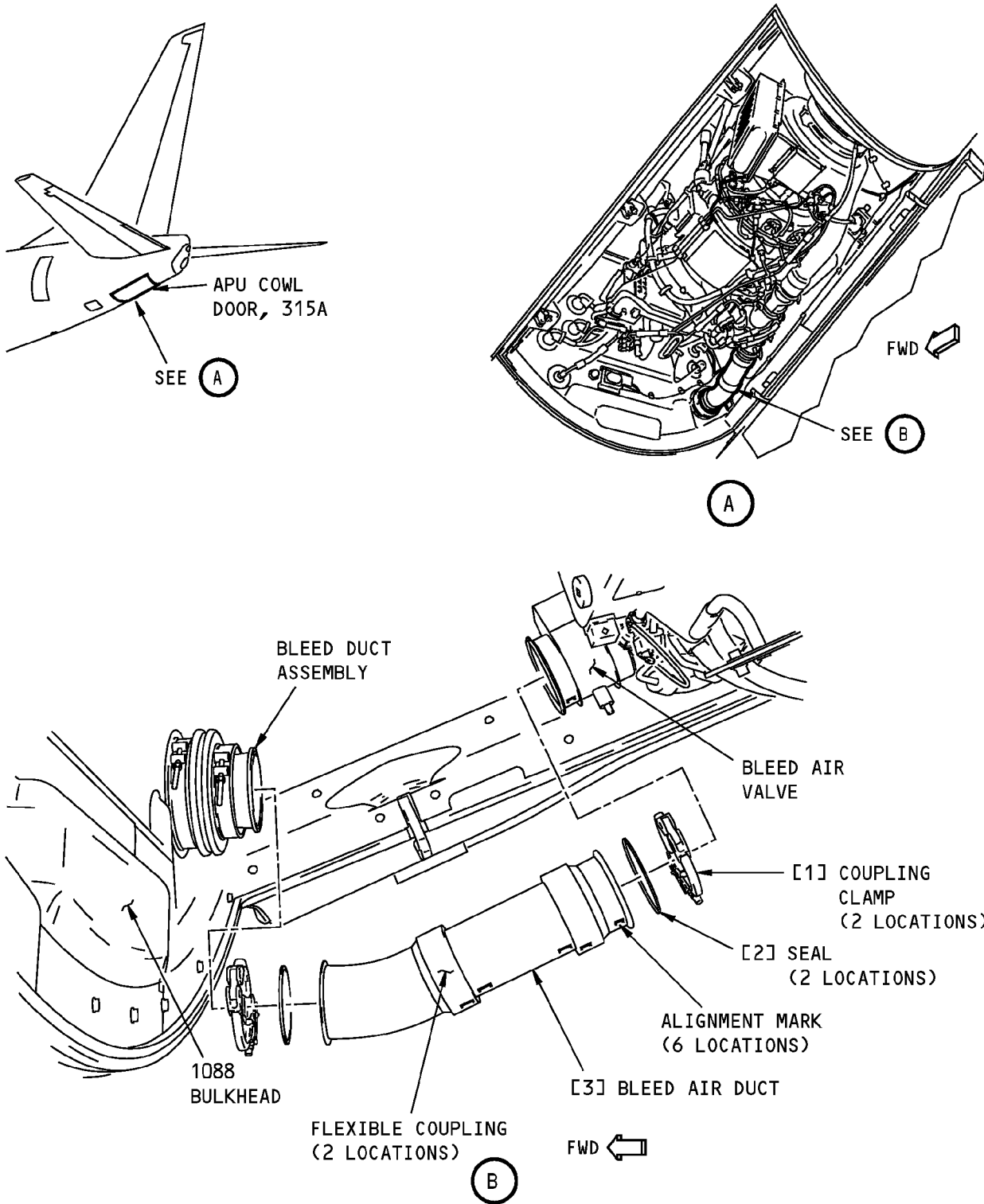
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**Bleed Air Duct Installation  
Figure 401/49-52-13-990-801**

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TASK 49-52-13-400-801

#### 3. Bleed Air Duct Installation

(Figure 401)

##### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

##### B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Seal	49-52-11-01-010	HAP 001-013, 015-026, 028-030
3	Bleed air duct	49-52-11-02-010	HAP 031-054, 101-999
		49-52-11-01-012	HAP 001-013, 015-026, 028-030
		49-52-11-02-015	HAP 031-054, 101-999

##### C. Location Zones

Zone	Area
211	Flight Compartment - Left
316	APU Compartment - Right

##### D. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### E. Procedure

SUBTASK 49-52-13-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS IF NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the bleed air duct [3]:
  - (a) Install the two seals [2] on the bleed air duct [3].
  - (b) Put the two coupling clamps [1] on the bleed air valve and bleed duct assembly.  
NOTE: The bleed duct assembly extends through the 1088 bulkhead.
  - (c) Put the bleed air duct [3] in its position.  
NOTE: To install the bleed air duct [3], make sure the directional flow arrow points away from the front of the APU.
  - (d) Open the two coupling clamps [1] to permit alignment of the bleed air duct [3] to the bleed air valve and the bleed duct assembly.
  - (e) Make sure the alignment marks on the two flexible couplings align with the two alignment marks on the bleed air duct [3].
  - (f) Make sure the center of the alignment mark on the bleed air duct [3] is  $\pm 0.16$  in. (4 mm) from the center of the alignment mark on the bleed air valve.
  - (g) Put the two coupling clamps [1] over the flanges of the bleed air valve, bleed air duct [3] and bleed duct assembly.

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1) Tighten the two coupling clamps [1] to 95 in-lb (10.7 N-m)-110 in-lb (12.4 N-m).

### F. Bleed Air Duct Installation Test

SUBTASK 49-52-13-860-003

(1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-13-860-004

(2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-52-13-710-001

(3) Do the installation test for the bleed air duct:

(a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

(b) Operate the APU for a minimum of five minutes.

(c) Set these switches on the P5 forward overhead panel:

1) Set the ISOLATION VALVE switch to the OPEN position.

2) Make sure the engines 1 and/or 2 BLEED switches are in the OFF position.

3) Make sure the L PACK and R PACK switches are in the OFF position.

4) Set the APU BLEED switch to the ON position.

NOTE: The bleed duct pressure must be more than 10 psig.

(d) During the APU operation, examine the bleed air duct for signs of air leakage.

(e) If you find air leakage, do these steps to repair the leakage:

1) Set these switches on the P5 forward overhead panel:

a) Set the APU BLEED switch to the OFF position.

b) Set the ISOLATION VALVE switch to the CLOSE position.

2) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

3) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.

4) Repair the cause of the air leakage.

5) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

6) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

7) Set these switches on the P5 forward overhead panel:

a) Set the ISOLATION VALVE switch to the OPEN position.

b) Set the APU BLEED switch to the ON position.

8) During the APU operation, examine the bleed air duct for signs of air leakage.

9) If you find air leakage, do the leakage repair again.

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- (f) If you did not find air leakage, set these switches on the P5 forward overhead panel:
  - 1) Set the APU BLEED switch to the OFF position.
  - 2) Set the ISOLATION VALVE switch to the CLOSE position.
- (g) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

### G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-13-410-001

- (1) Close this APU cowl door. To close this APU cowl door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU cowl door.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU cowl door.
- (g) Close the three latches.

————— **END OF TASK** —————

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## AIRCRAFT MAINTENANCE MANUAL

### INLET PRESSURE SENSOR - REMOVAL/INSTALLATION

#### 1. General

A. This procedure has these tasks:

- (1) A removal of the inlet pressure sensor
- (2) An installation of the inlet pressure sensor.

B. The inlet pressure sensor (P2) is installed on the compressor inlet section of the APU.

#### **TASK 49-52-31-000-801**

#### 2. Inlet Pressure Sensor Removal

(Figure 401)

A. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

B. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

C. Prepare for the Removal

SUBTASK 49-52-31-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-52-31-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-31-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.

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- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### D. Inlet Pressure Sensor Removal

SUBTASK 49-52-31-020-001

- (1) Do these steps to remove the inlet pressure sensor [1]:
  - (a) Disconnect the electrical connector (P18) [2] from the inlet pressure sensor [1].
  - (b) Loosen the nut [4] that attaches the inlet pressure sensor [1] to the compressor inlet section of the APU.
  - (c) Turn the inlet pressure sensor [1] counterclockwise until the flange disengages from the stud.
  - (d) Remove the inlet pressure sensor [1].
  - (e) Remove the packing [3] from the inlet pressure sensor [1].
    - 1) Discard the packing [3].
  - (f) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

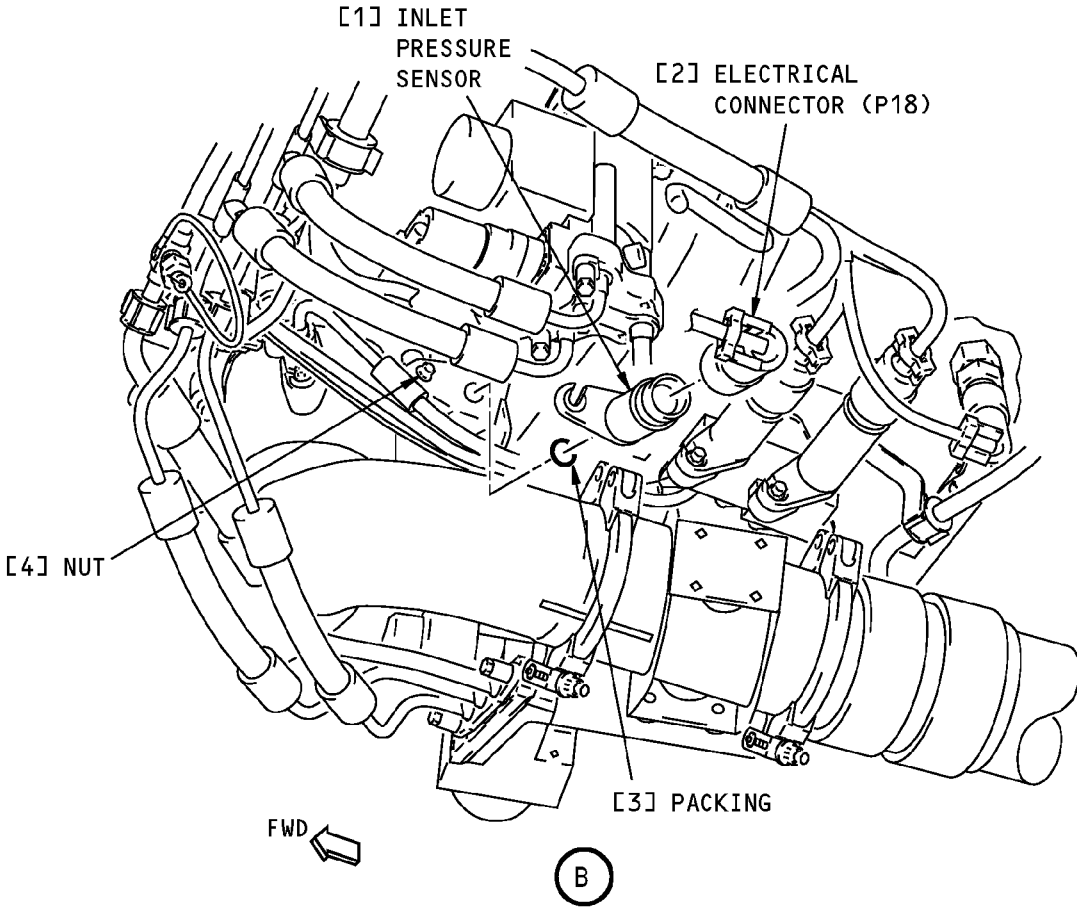
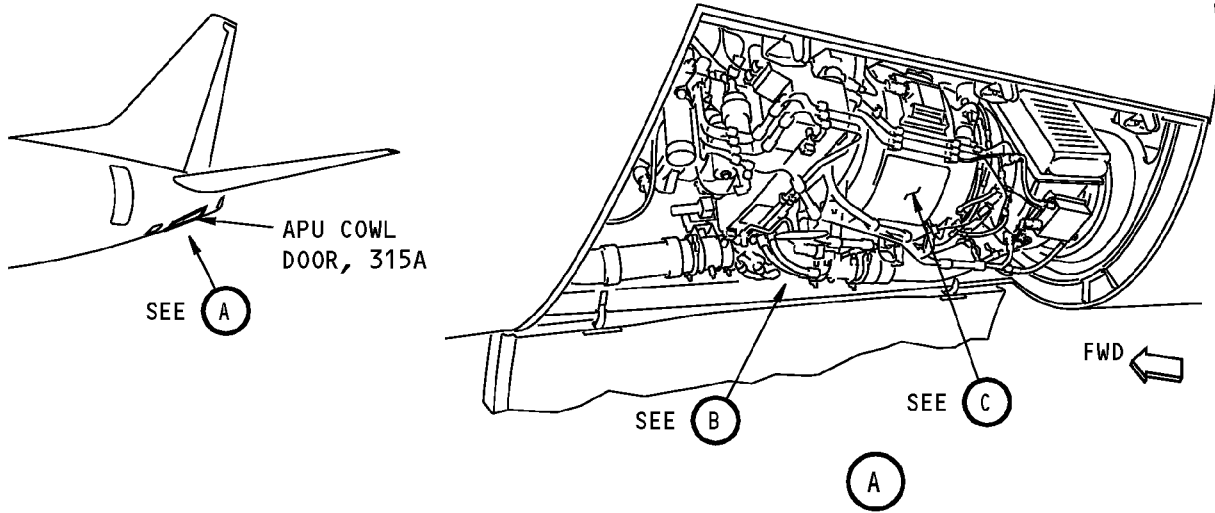
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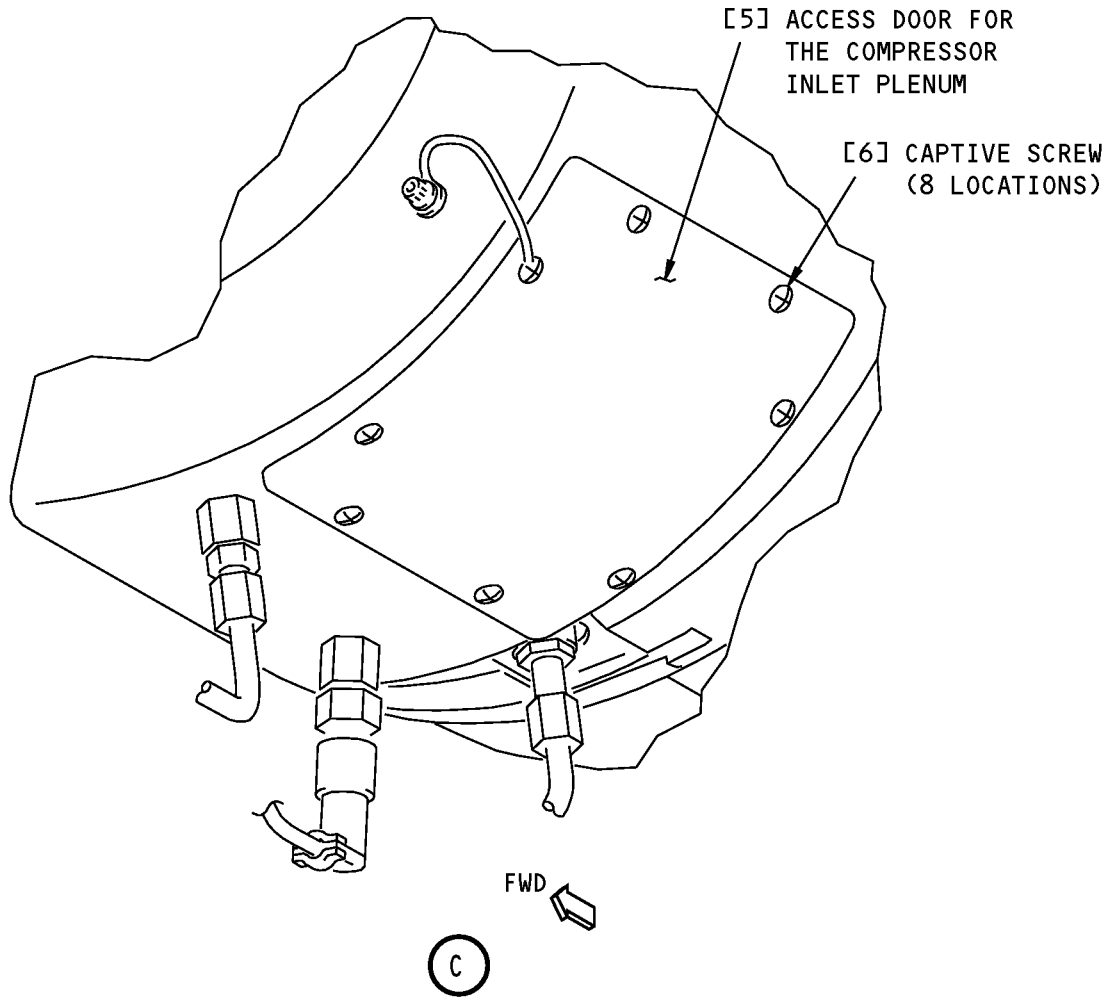
**Inlet Pressure Sensor Installation  
Figure 401 (Sheet 1 of 2)/49-52-31-990-801**

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Figure 401 (Sheet 2 of 2)/49-52-31-990-801**

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## TASK 49-52-31-400-801

### 3. Inlet Pressure Sensor Installation

(Figure 401)

#### A. References

Reference	Title
49-61-00-700-801	APU BITE Procedure (P/B 201)

#### B. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

#### C. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236

#### D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Inlet pressure sensor	49-52-31-01-010	HAP 001-013, 015-026, 028-030
3	Packing	49-52-31-02-010	HAP 031-054, 101-999
		49-52-31-01-015	HAP 001-013, 015-026, 028-030
		49-52-31-02-015	HAP 031-054, 101-999

#### E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### F. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### G. Procedure

SUBTASK 49-52-31-160-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

(1) Do these steps to clean the tube for the inlet pressure sensor:

**NOTE:** It is not necessary to clean the tube for the inlet pressure sensor if the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 is not available.

(a) Loosen the eight captive screws [6] that attach the access door [5] to the compressor inlet plenum.

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- (b) Remove the access door [5] from the compressor inlet plenum.

NOTE: A lanyard is attached to the access door to keep the access door with the APU.

- (c) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to blow the air through the outer tube for the inlet pressure sensor.

NOTE: It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to blow the air through the outer tube.

- (d) Make sure the air flows through the outer tube to the inner tube.

NOTE: You can find the inner tube for the inlet pressure sensor in the left forward side of the compressor inlet plenum. You get access to the inner tube through the access door.

- (e) If there is no or minimum air flow from the inner tube, remove the blockage of unwanted materials or repair the problems that you find.

- (f) Install the access door [5] to the compressor inlet plenum with the eight captive screws [6].

SUBTASK 49-52-31-420-001

- (2) Do these steps to install the inlet pressure sensor [1]:

- (a) Lubricate the new packing [3] with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.

- (b) Install the packing [3] on the inlet pressure sensor [1].

- (c) Install the inlet pressure sensor [1].

- (d) Turn the inlet pressure sensor [1] clockwise until the flange fully engages the stud.

- (e) Tighten the nut [4] to 40 pound-inches (4.5 newton-meters).

- (f) Connect the electrical connector (P18) [2] to the inlet pressure sensor [1].

#### H. Inlet Pressure Sensor Installation Test

SUBTASK 49-52-31-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-31-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-52-31-740-001

- (3) Do the installation test for the inlet pressure sensor:

- (a) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

- 1) If maintenance message(s) show for the APU bleed air system or the inlet pressure sensor (P2), refer to the applicable Maintenance Message Index in the FIM.

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### I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-31-410-001

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— END OF TASK —————

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# AIRCRAFT MAINTENANCE MANUAL

## TOTAL PRESSURE SENSOR - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the total pressure sensor
- (2) An installation of the total pressure sensor.

B. The total pressure sensor (PT) is installed on the compressor inlet section of the APU.

#### **TASK 49-52-32-000-801**

### 2. Total Pressure Sensor Removal

(Figure 401)

A. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

B. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

C. Prepare for the Removal

SUBTASK 49-52-32-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-52-32-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-32-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.

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- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### D. Total Pressure Sensor Removal

SUBTASK 49-52-32-020-001

- (1) Do these steps to remove the total pressure sensor [1]:
  - (a) Disconnect the electrical connector (P19) [2] from the total pressure sensor [1].
  - (b) Loosen the nut [4] that attaches the total pressure sensor [1] to the compressor inlet section of the APU.
  - (c) Turn the total pressure sensor [1] counterclockwise until the flange disengages from the stud.
  - (d) Remove the total pressure sensor [1].
  - (e) Remove the packing [3] from the total pressure sensor [1].
    - 1) Discard the packing [3].
  - (f) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

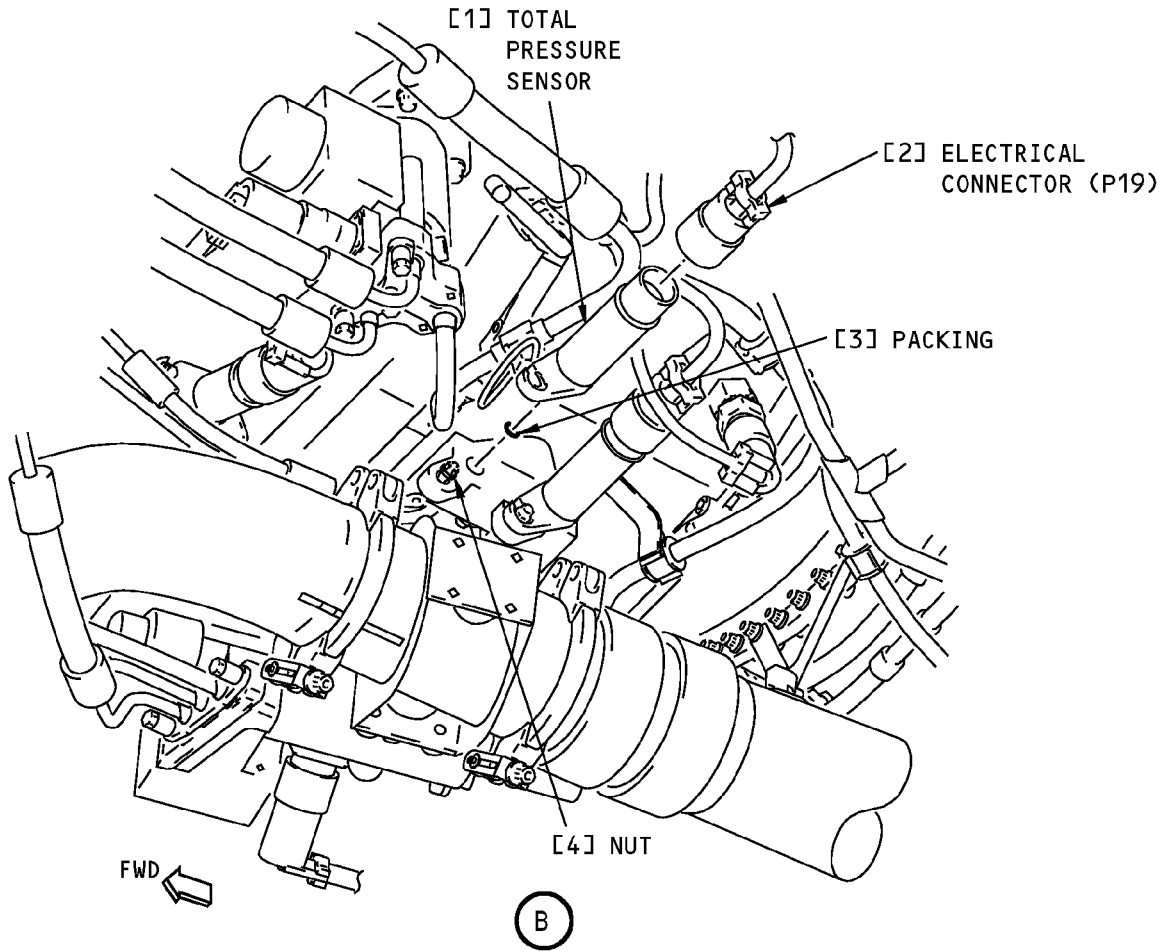
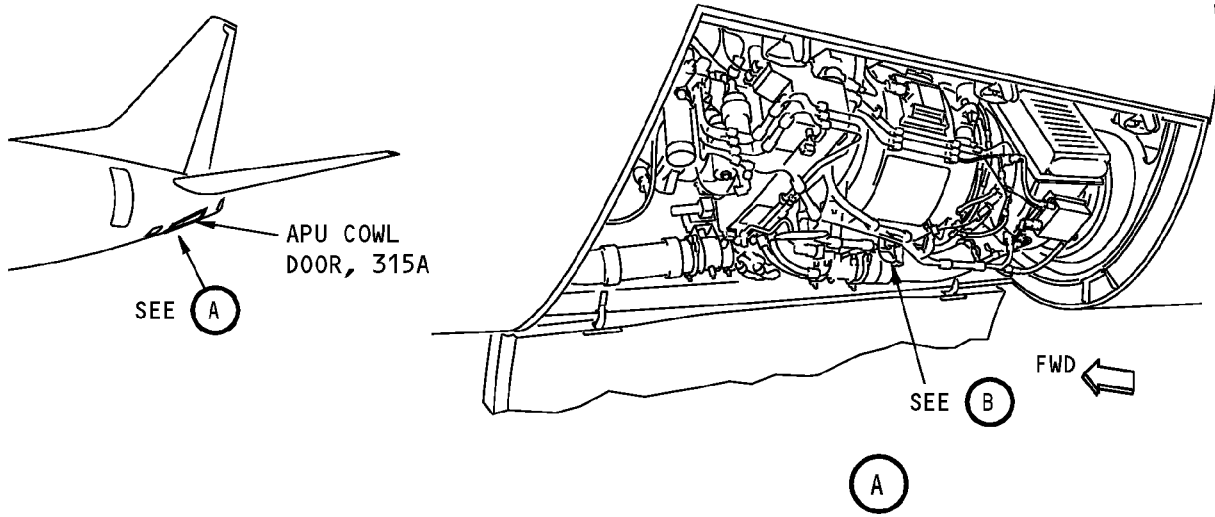
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**Total Pressure Sensor Installation  
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TASK 49-52-32-400-801

#### 3. Total Pressure Sensor Installation

(Figure 401)

##### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

##### B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236

##### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Total pressure sensor	49-52-32-01-010	HAP 001-013, 015-026, 028-030
3	Packing	49-52-32-02-010	HAP 031-054, 101-999
		49-52-32-01-015	HAP 001-013, 015-026, 028-030
		49-52-32-02-015	HAP 031-054, 101-999

##### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

##### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### F. Procedure

SUBTASK 49-52-32-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the total pressure sensor [1]:
  - (a) Lubricate the new packing [3] with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.
  - (b) Install the packing [3] on the total pressure sensor [1].
  - (c) Install the total pressure sensor [1].
  - (d) Turn the total pressure sensor [1] clockwise until the flange fully engages the stud.
  - (e) Tighten the nut [4] to 40 pound-inches (4.5 newton-meters).
  - (f) Connect the electrical connector (P19) [2] to the total pressure sensor [1].

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### G. Total Pressure Sensor Installation Test

SUBTASK 49-52-32-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-32-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-52-32-710-001

- (3) Do the installation test for the total pressure sensor:

- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (b) Operate the APU for a minimum of five minutes.
- (c) During the APU operation, examine the total pressure sensor for signs of air leakage.
- (d) If you find air leakage, do these steps to repair the leakage:
  - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
  - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
  - 3) Repair the cause of the air leakage.
  - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
  - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - 6) During the APU operation, examine the total pressure sensor for signs of air leakage.
  - 7) If you find air leakage, do the leakage repair again.
- (e) Set these switches on the P5 forward overhead panel:
  - 1) Set the ISOLATION VALVE switch to the OPEN position.
  - 2) Make sure the engines 1 and/or 2 BLEED switches are in the OFF position.
  - 3) Make sure the L PACK and R PACK switches are in the OFF position.
  - 4) Set the APU BLEED switch to the ON position.

NOTE: The bleed duct pressure must be more than 10 psig.
- (f) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
  - 1) If maintenance message(s) show for the APU bleed air system or the total pressure sensor (PT), refer to the applicable Maintenance Message Index in the FIM.
- (g) Set these switches on the P5 forward overhead panel:
  - 1) Set the APU BLEED switch to the OFF position.
  - 2) Set the ISOLATION VALVE switch to the CLOSE position.

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- (h) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-32-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

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## DELTA PRESSURE SENSOR - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the delta pressure sensor
- (2) An installation of the delta pressure sensor.

B. The delta pressure sensor (DP) is installed on the compressor inlet section of the APU.

#### **TASK 49-52-33-000-801**

### 2. Delta Pressure Sensor Removal

(Figure 401)

A. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

B. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

C. Prepare for the Removal

SUBTASK 49-52-33-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-52-33-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-33-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.

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- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### D. Delta Pressure Sensor Removal

SUBTASK 49-52-33-020-001

- (1) Do these steps to remove the delta pressure sensor [1]:
  - (a) Disconnect the electrical connector (P20) [2] from the delta pressure sensor [1].
  - (b) Loosen the nut [5] that attaches the delta pressure sensor [1] to the compressor inlet section of the APU.
  - (c) Turn the delta pressure sensor [1] counterclockwise until the flange disengages from the stud.
  - (d) Remove the delta pressure sensor [1].
  - (e) Remove the packing [4] and packing [3] from the delta pressure sensor [1].
    - 1) Discard the packing [4] and packing [3].
  - (f) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

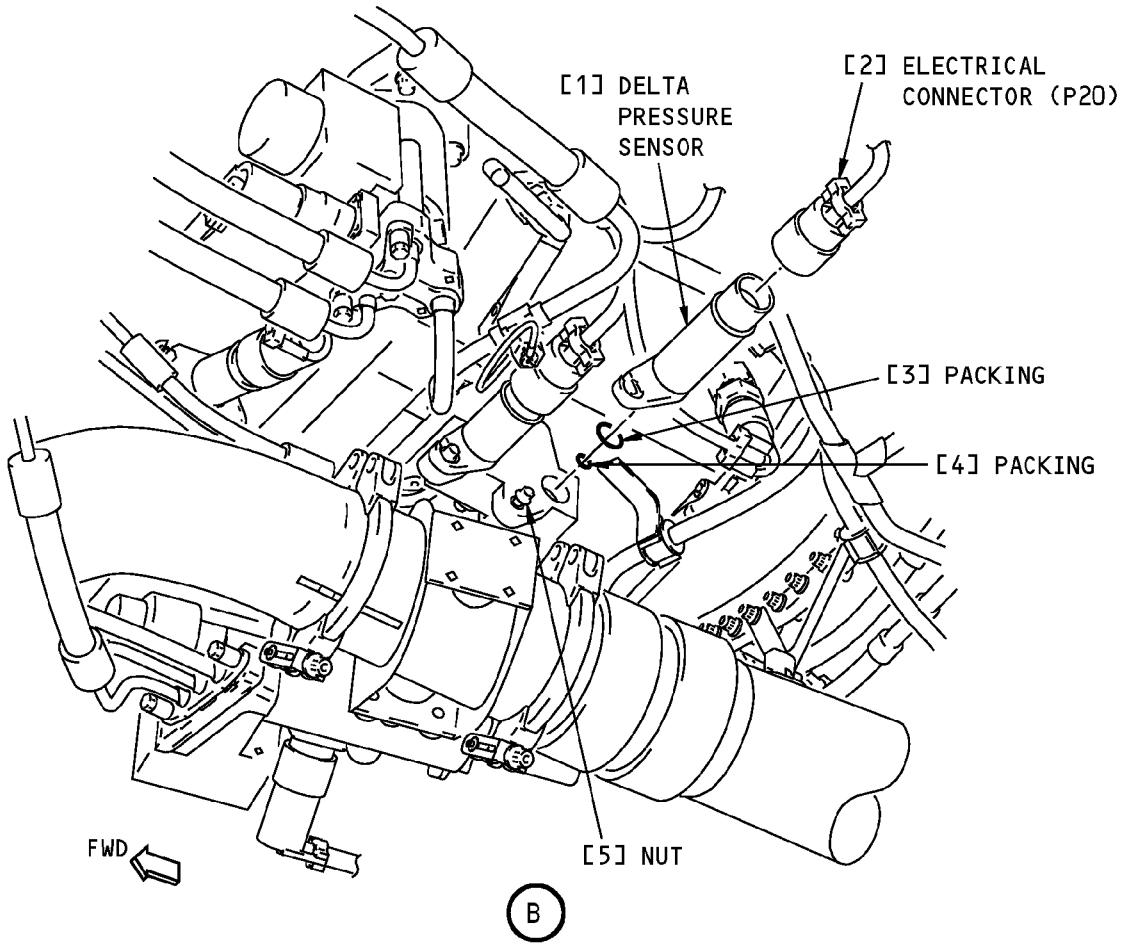
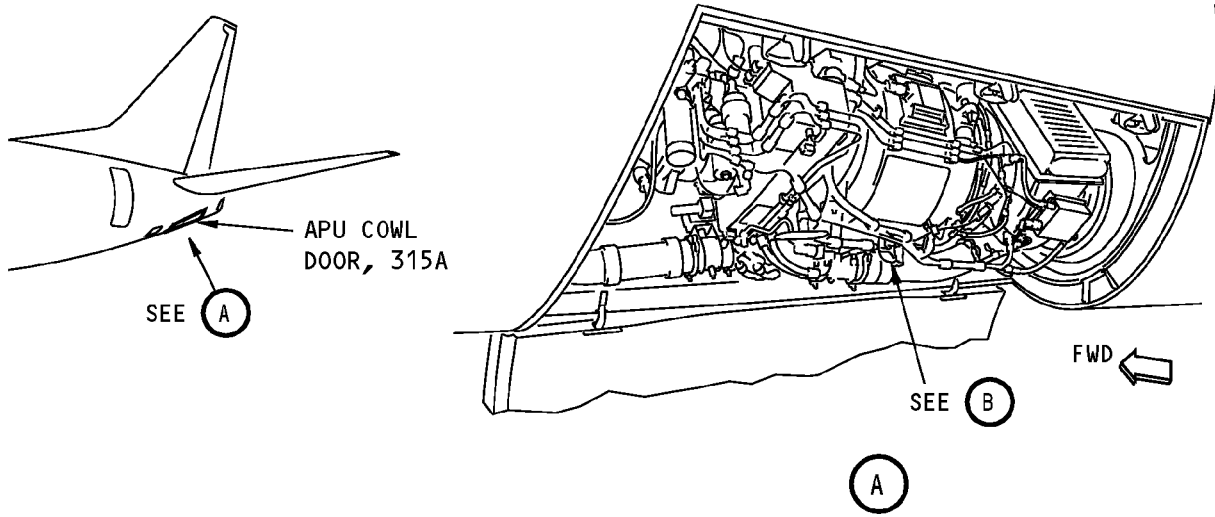
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**Delta Pressure Sensor Installation  
Figure 401/49-52-33-990-801**

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TASK 49-52-33-400-801

#### 3. Delta Pressure Sensor Installation

(Figure 401)

##### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

##### B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236

##### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Delta pressure sensor	49-52-33-01-010	HAP 001-013, 015-026, 028-030
3	Packing	49-52-33-02-010	HAP 031-054, 101-999
		49-52-33-01-020	HAP 001-013, 015-026, 028-030
4	Packing	49-52-33-02-020	HAP 031-054, 101-999
		49-52-33-01-015	HAP 001-013, 015-026, 028-030
		49-52-33-02-015	HAP 031-054, 101-999

##### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

##### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### F. Procedure

SUBTASK 49-52-33-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the delta pressure sensor [1]:
  - (a) Lubricate the new packing [3] and new packing [4] with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.
  - (b) Install the packing [3] and packing [4] on the delta pressure sensor [1].
  - (c) Install the delta pressure sensor [1].
  - (d) Turn the delta pressure sensor [1] clockwise until the flange fully engages the stud.

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- (e) Tighten the nut [5] to 40 pound-inches (4.5 newton-meters).
- (f) Connect the electrical connector (P20) [2] to the delta pressure sensor [1].

### G. Delta Pressure Sensor Installation Test

SUBTASK 49-52-33-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-33-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-52-33-710-001

- (3) Do the installation test for the delta pressure sensor:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Operate the APU for a minimum of five minutes.
  - (c) During the APU operation, examine the delta pressure sensor for signs of air leakage.
  - (d) If you find air leakage, do these steps to repair the leakage:
    - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
    - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
    - 3) Repair the cause of the air leakage.
    - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
    - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
    - 6) During the APU operation, examine the delta pressure sensor for signs of air leakage.
    - 7) If you find air leakage, do the leakage repair again.
  - (e) Set these switches on the P5 forward overhead panel:
    - 1) Set the ISOLATION VALVE switch to the OPEN position.
    - 2) Make sure the engines 1 and/or 2 BLEED switches are in the OFF position.
    - 3) Make sure the L PACK and R PACK switches are in the OFF position.
    - 4) Set the APU BLEED switch to the ON position.

NOTE: The bleed duct pressure must be more than 10 psig.
  - (f) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
    - 1) If maintenance message(s) show for the APU bleed air system or the delta pressure sensor (DP), refer to the applicable Maintenance Message Index in the FIM.
  - (g) Set these switches on the P5 forward overhead panel:
    - 1) Set the APU BLEED switch to the OFF position.

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2) Set the ISOLATION VALVE switch to the CLOSE position.

(h) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-33-410-001

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

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## AIRCRAFT MAINTENANCE MANUAL

### SURGE CONTROL VALVE - REMOVAL/INSTALLATION

#### 1. General

A. This procedure has these tasks:

- (1) A removal of the surge control valve
- (2) An installation of the surge control valve.

B. The surge control valve is installed between the compressor discharge duct and the surge duct.

#### **TASK 49-52-41-000-801**

#### 2. Surge Control Valve Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
316	APU Compartment - Right

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-52-41-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-52-41-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-41-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.

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- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### E. Surge Control Valve Removal

SUBTASK 49-52-41-020-001

- (1) Disconnect the electrical connector (P9) [1] from the surge control valve [9].

SUBTASK 49-52-41-020-002

- (2) Do these steps to disconnect the supply, return and fuel drain tubes [5], [6], [7] from the surge control valve [9]:
  - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049 below the surge control valve [9].
  - (b) Loosen the two bolts [4] that attach the bracket to the surge control valve [9].

**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (c) Disconnect the fuel drain tube [7] from the surge control valve [9].
- (d) Disconnect the supply and return tubes [5], [6] for the inlet guide vane (IGV) actuator and fuel control unit from the surge control valve [9].
- (e) Remove the two packings [2], two packings [3] and two packings [8] from the three tubes [6], [5], [7].
  - 1) Discard the two packings [2], two packings [3] and two packings [8].
- (f) Drain the fuel from the three tubes [5], [6], [7] into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (g) Install a cap on each of the three tubes [5], [6], [7].

SUBTASK 49-52-41-020-003

- (3) Do these steps to remove the surge control valve [9]:
  - (a) Remove the two coupling clamps [11] that hold the surge control valve [9] to the compressor discharge duct and surge duct.
  - (b) Remove the surge control valve [9].
  - (c) Remove the two seals [10] from the surge control valve [9].
  - (d) Examine the two seals [10] for signs of deterioration and leakage.
    - 1) Discard the two seals [10] if you find signs of deterioration or leakage.
  - (e) Use the 1 gallon (4 l) fuel resistant container, STD-4049 to drain the fuel from the surge control valve [9].
  - (f) Make sure you install all necessary protection covers.
  - (g) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

————— **END OF TASK** —————

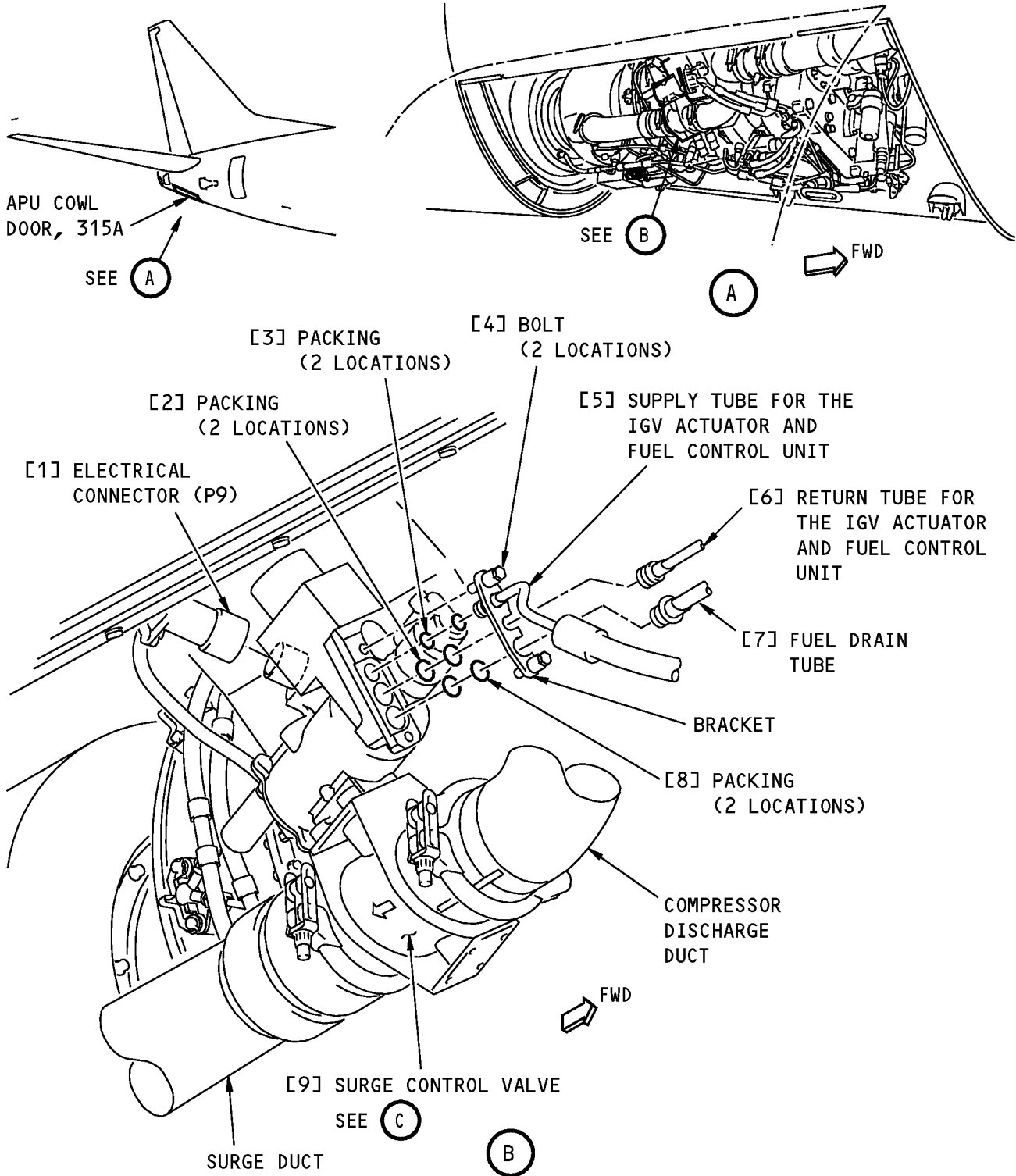
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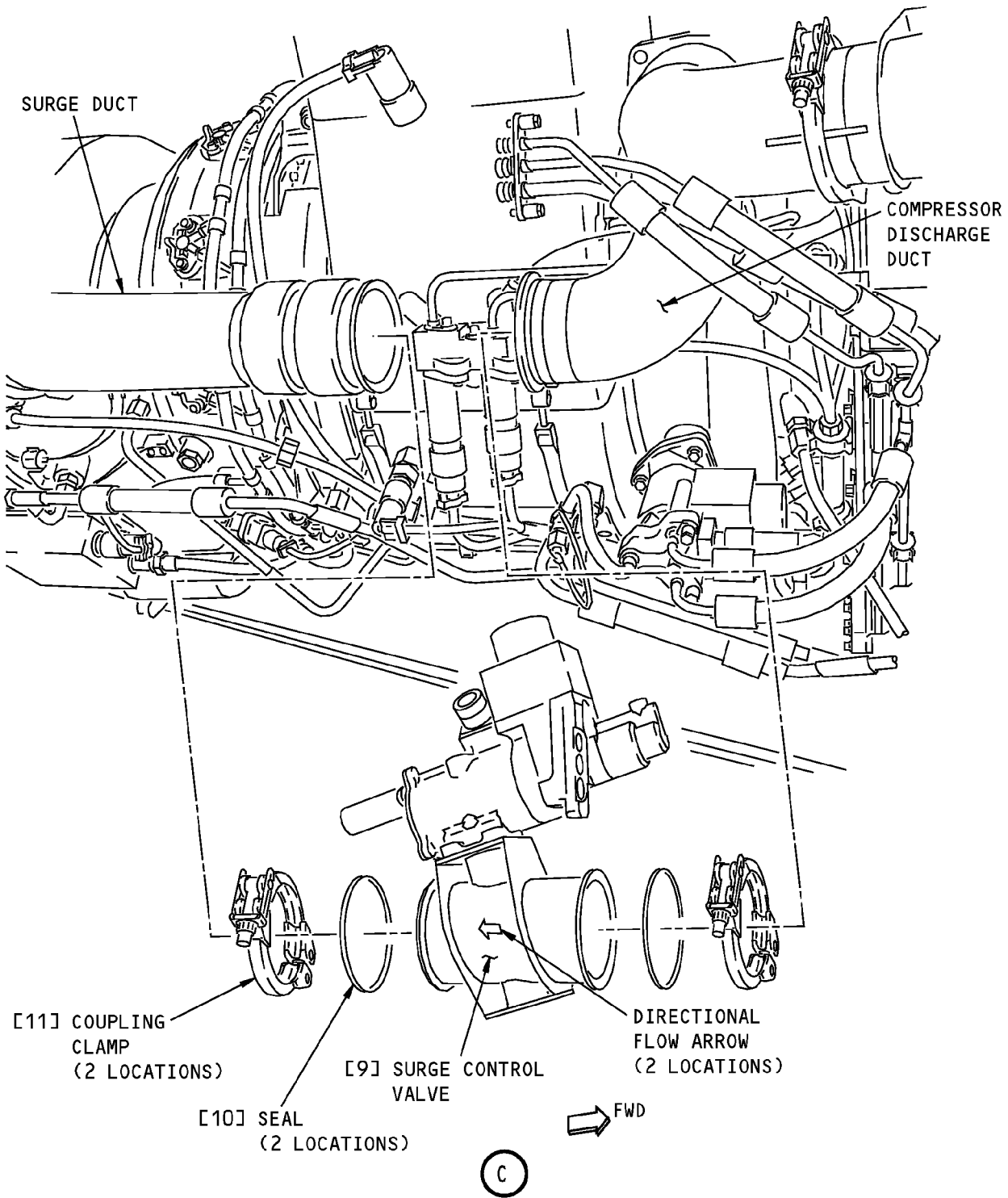
**Surge Control Valve Installation  
Figure 401 (Sheet 1 of 2)/49-52-41-990-801**

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**Surge Control Valve Installation  
Figure 401 (Sheet 2 of 2)/49-52-41-990-801**

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### AIRCRAFT MAINTENANCE MANUAL

TASK 49-52-41-400-801

#### 3. Surge Control Valve Installation

(Figure 401)

##### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

##### B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236

##### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	49-52-12-01-035	HAP 001-013, 015-026, 028-030
		49-52-12-02-035	HAP 031-054, 101-999
3	Packing	49-52-12-01-030	HAP 001-013, 015-026, 028-030
		49-52-12-02-030	HAP 031-054, 101-999
8	Packing	49-52-12-01-025	HAP 001-013, 015-026, 028-030
		49-52-12-02-025	HAP 031-054, 101-999
9	Surge control valve	49-52-41-01-045	HAP 001-013, 015-026, 028-031
		49-52-41-01-055	HAP 001-013, 015-026, 028-030
		49-52-41-02-030	HAP 031-054, 101-999
		49-52-41-02-080	HAP 031-050, 054, 101-999
10	Seal	49-52-41-01-040	HAP 001-013, 015-026, 028-030
		49-52-41-02-022	HAP 031-054, 101-999

##### D. Location Zones

Zone	Area
211	Flight Compartment - Left
316	APU Compartment - Right

##### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

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#### F. Procedure

SUBTASK 49-52-41-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the surge control valve [9]:
  - (a) Install the two seals [10] on the surge control valve [9].
  - (b) Put the two coupling clamps [11] on the compressor discharge duct and surge duct.
  - (c) Carefully put the surge control valve [9] in its position on the compressor discharge duct and surge duct.

**NOTE:** To install the surge control valve [9], make sure the directional flow arrow points to the aft of the APU.

- 1) Open the two coupling clamps [11] to permit the mark on the surge control valve [9] to align with the mark on the compressor discharge duct.
- 2) Make sure the mark on the surge control valve [9] aligns with the mark on the compressor discharge duct.
- (d) Put the two coupling clamps [11] over the flanges of the surge control valve [9], compressor discharge duct and surge duct.
  - 1) Tighten the two coupling clamps [11] to 93 pound-inches (10.5 newton-meters).

SUBTASK 49-52-41-420-002

- (2) Do these steps to connect the supply, return and fuel drain tubes [5], [6], [7] to the surge control valve [9]:
  - (a) Lubricate the two new packings [3] and two new packings [2] for the supply and return tubes [5], [6] for the IGV actuator and fuel control unit with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.
  - (b) Lubricate the two new packings [8] for the fuel drain tube [7] with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.
  - (c) Remove the caps from the three tubes [5], [6], [7].
  - (d) Install the two packings [3] on the supply tube [5] for the IGV actuator and fuel control unit.
  - (e) Install the two packings [2] on the return tube [6] for the IGV actuator and fuel control unit.
  - (f) Install the two packings [8] on the fuel drain tube [7].
  - (g) Connect the three tubes [5], [6], [7] with the bracket to the surge control valve [9].
  - (h) Tighten the two bolts [4] that attach the bracket to the surge control valve [9] to 50 pound-inches (5.7 newton-meters).

SUBTASK 49-52-41-420-003

- (3) Connect the electrical connector (P9) [1] to the surge control valve [9].

#### G. Surge Control Valve Installation Test

SUBTASK 49-52-41-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-41-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-52-41-710-001

- (3) Do the installation test for the surge control valve:

- Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- Operate the APU for a minimum of five minutes.
- During the APU operation, examine the surge control valve for signs of air and fuel leakage.

NOTE: A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted during an APU operation from the forward drain on the APU drain seal.

- If you find air leakage or more than the fuel leakage rate, then do these steps to repair the leakage:
  - Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
  - Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
  - Repair the cause of the fuel or air leakage.
  - Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
  - Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - During the APU operation, examine the surge control valve for signs of air and fuel leakage.
  - If you find air leakage or more than the fuel leakage rate, then do the leakage repair again.
- Set these switches on the P5 forward overhead panel:
  - Set the ISOLATION VALVE switch to the OPEN position.
  - Make sure the engines 1 and/or 2 BLEED switches are in the OFF position.
  - Make sure the L PACK and R PACK switches are in the OFF position.
  - Set the APU BLEED switch to the ON position.

NOTE: The bleed duct pressure must be more than 10 psig.
- Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
  - If maintenance message(s) show for the APU bleed air system or the surge control valve, refer to the applicable Maintenance Message Index in the FIM.
- Set these switches on the P5 forward overhead panel:
  - Set the APU BLEED switch to the OFF position.
  - Set the ISOLATION VALVE switch to the CLOSE position.
- If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-41-410-001

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— END OF TASK —————

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### APU CONTROLS - MAINTENANCE PRACTICES

#### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
  - (1) APU Built-In Test Equipment (BITE) Procedure
  - (2) APU Controls Operational Check

#### **HAP 031-054, 101-999**

- (3) Electronic Control Unit (ECU) Software Installation with an Airborne Data Loader

#### **HAP 001-013, 015-026, 028-030**

- (4) Electronic Control Unit (ECU) Software Installation with a Portable Data Loader

#### **HAP ALL**

- (5) Low Oil Quantity BITE Deactivation
- (6) Low Oil Quantity BITE Activation.

#### **HAP ALL; AIRPLANES WITH APU SOFTWARE PART NUMBER 491A-TUS-A04-00 and on.**

- (7) Ice Logic Deactivation
- (8) Ice Logic Activation.

#### **HAP ALL**

- C. The APU BITE procedure task gives the instructions to use the control display unit (CDU) for the APU BITE procedure. There are two CDUs on the P9 forward electronics panel in the flight compartment. You make the selection for the CURRENT STATUS, FAULT HISTORY, MAINTENANCE HISTORY, IDENT/CONFIG, INPUT MONITORING and OIL QUANTITY data on the MAIN MENU page for the APU BITE TEST.
  - (1) The CURRENT STATUS page shows the current record of maintenance message(s).
  - (2) The FAULT HISTORY page shows the fault message(s). A fault message identifies a type of APU protective shutdown and its related problems, if any, that caused the APU protective shutdown. If you replace the electronic control unit (ECU) from a different airplane, the FAULT HISTORY page can contain APU engine problems from the different airplane.
  - (3) The MAINTENANCE HISTORY page shows the maintenance message(s). A maintenance message identifies a specified problem in the APU system. If you replace the ECU from a different airplane, the MAINTENANCE HISTORY page can contain APU engine problems from the different airplane.
  - (4) The IDENT/CONFIG page shows the serial number, hours in operation and cycles for the APU. You can set the hours since installation of the APU on the airplane to 0.0. The IDENT/CONFIG page also shows the hardware part number, serial number and operational software part number for the ECU. You can also see the program data for the data memory module.
  - (5) The INPUT MONITORING page shows the APU engine data while the APU is in operation. There are four pages of APU engine data.
    - (a) The first page shows these APU engine data:
      - 1) APU speed
      - 2) Exhaust gas temperature, T5 (EGT)
      - 3) Position of the inlet guide vanes (IGV) and surge control valve (SCV)
      - 4) Delta pressure from the delta pressure sensor (DP)

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- 5) Total pressure from the total pressure sensor (PT)
  - 6) Inlet pressure from the inlet pressure sensor (P2)
  - 7) Inlet temperature from the inlet temperature sensor (T2)
  - 8) Fuel torquemotor current from the fuel control unit
  - 9) Fuel flow.
- (b) The second page shows these APU engine data:
- 1) Oil temperature
  - 2) Fuel temperature
  - 3) APU starter-generator load
  - 4) Position of the APU master switch, main engine start (MES) (ENGINE START 1 and 2) switches and air/ground switch
  - 5) Position of the L and R PACK switches.
- (c) The third page shows these APU engine data:
- 1) Position of the APU bleed switch, air inlet door, bleed air valve and the APU fuel shutoff valve
  - 2) If the APU fire switch (handle), S10, on the P8 aft electronic panel or the APU remote fire switch (handle), S16, on the P28 APU remote control panel was pulled
  - 3) Operation of the fire detection system
  - 4) Airplane model number.
- (d) The fourth page shows these APU engine data:
- 1) Received command signal to the ready to load, start relay, loadshed and ignition unit circuit
  - 2) Received command signal to the solenoid for the fuel control unit and bleed air valve
  - 3) OVER SPEED, FAULT, LOW OIL PRESSURE (LOP) and MAINT (indicator) lights, on the P5 forward overhead panel, are on or off.
- (6) The OIL QUANTITY page shows the oil level for the APU. If the oil level shows ADD or LOW, you will see the APU hours from the first time the ECU senses this ADD or LOW oil condition.
- (7) You can do the APU BITE procedure with the APU master switch, on the P5 forward overhead panel, in the OFF or ON position.
- D. The APU controls operational check is a short APU BITE procedure that does a check of the data memory module, electronic control unit, speed sensor and two EGT thermocouples for operational data. The operational data for the data memory module and electronic control unit are found in the IDENT/CONFIG page in the main menu of the APU BITE TEST. The operational data for the speed sensor and two EGT thermocouples are found in the INPUT MONITORING page in the main menu of the APU BITE TEST.

### HAP 031-054, 101-999

- E. The ECU software installation task gives the instructions to use the airborne data loader for loading a new software version to the ECU.

### HAP 001-013, 015-026, 028-030

- F. The ECU software installation task gives the instructions to use the portable data loader for loading a new software version to the ECU.

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HAP 001-013, 015-026, 028-030 (Continued)

HAP ALL; AIRPLANES WITH -222 THRU -999 ECU

G. The ECU software installation task gives the instructions to use the airborne data loader or portable data loader for loading a new software version to the ECU.

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H. The low oil quantity BITE deactivation and activation tasks give the instructions to deactivate or activate the MAINT light on the P5 forward overhead panel for low oil quantity indication. You must do the APU BITE procedure to deactivate or activate the MAINT light. A low oil quantity indication has no effect on the APU operation. A low oil pressure indication will cause an APU protective shutdown.

TASK 49-61-00-700-801

2. APU BITE Procedure

(Figure 201)

A. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

B. Procedure

SUBTASK 49-61-00-740-001

(1) Do the APU BITE procedure:

(a) If you get access to the CDU for the first time or were in an airplane system other than the APU, push the INIT REF function key until the PERF INT page shows on the CDU display.

NOTE: The PERF INT page or IDENT page can show on the CDU display.

(b) If you see the PERF INT or IDENT page, push the line select key adjacent to <INDEX.

NOTE: The INIT/REF INDEX page shows on the CDU display.

(c) If you see the INIT/REF INDEX page, push the line select key adjacent to MAINT > .

NOTE: The MAINT BITE INDEX page shows on the CDU display.

(d) If you see the MAINT BITE INDEX page, push the line select key adjacent to APU > .

NOTE: If the last APU shutdown or cycle was an APU protective shutdown and/or the FAULT light is on, the FAULT HISTORY page for the APU BITE TEST shows on the CDU display. The related problem(s) that caused the APU protective shutdown with the date, Greenwich mean time (GMT) and APU cycle will show on this page.

NOTE: If the MAINT light is on, the CURRENT STATUS page for the APU BITE TEST shows on the CDU display. The related problem(s) that caused the MAINT light to come on will show on this page.

NOTE: If the FAULT and MAINT lights are off and there are no APU protective shutdowns, the MAIN MENU page for the APU BITE TEST shows on the CDU display. You can find the FAULT and MAINT lights on the P5 forward overhead panel.

(e) If you see the FAULT HISTORY page for the APU BITE TEST, write the maintenance message number(s) (MAINT MSG) for the fault message(s) to be corrected.

NOTE: The maintenance message number(s) that you write is necessary to go to the correct fault isolation task(s) in the FIM.

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- 1) Refer to 49-MAINT MSG INDEX at the front of the FIM to find the fault isolation task(s) for the applicable maintenance message number(s).
- 2) If there are more than one FAULT HISTORY page, push the previous page key (PREV PAGE) or next page key (NEXT PAGE) to go to the other pages.

NOTE: The number of pages are shown on the top right side of the FAULT HISTORY page.

- 3) If you see the ">" symbol adjacent to CURRENT STATUS (CURRENT STATUS >) on the FAULT HISTORY page, the fault message(s) are active.
  - a) Push the line select key adjacent to CURRENT STATUS > to see the symptom(s) that cause the APU protective shutdown.
- 4) If you do not see CURRENT STATUS > on the FAULT HISTORY page, the fault message(s) are intermittent.
- 5) If it is necessary to see other APU cycles which have the same symptom, push the line select key adjacent to OTHER OCCURRENCES.

NOTE: If there are no other APU cycles which have the same symptom, you will see the message "NO OTHER OCCURRENCES".

- a) Push the line select key adjacent to < INDEX to go back to the FAULT HISTORY or MAINTENANCE HISTORY page.
- 6) If it is necessary to go back to the MAIN MENU page for the APU BITE TEST, push the line select key adjacent to < INDEX.

NOTE: The MAIN MENU page shows on the CDU display.

- (f) If you see the MAIN MENU page for the APU BITE TEST on the CDU display, push the line select key adjacent to < CURRENT STATUS.
- (g) If you see the CURRENT STATUS page for the APU BITE TEST, look at the current record of maintenance message(s).

NOTE: If there are no current maintenance messages on the CURRENT STATUS page, you will see the message "no failures found".

NOTE: If you see a maintenance message on the CURRENT STATUS page that was monitored continuously by the ECU and you corrected the problem while you were on this page, you will see the message "FAULT CLEARED".

- 1) Write the maintenance message number(s) (MAINT MSG) for the maintenance message(s) to be corrected.

NOTE: The maintenance message number(s) that you write is necessary to go to the correct fault isolation task(s) in the FIM.

- 2) Refer to 49-MAINT MSG INDEX at the front of the FIM to find the fault isolation task(s) for the applicable maintenance message number(s).
- 3) If there are more than one CURRENT STATUS page, push the previous page key (PREV PAGE) or next page key (NEXT PAGE) to go to the other pages.

NOTE: The number of pages are shown on the top right side of the CURRENT STATUS page.

- 4) If it is necessary to see other APU cycles which have the same symptom, push the line select key adjacent to OTHER OCCURRENCES.

NOTE: If there are no other APU cycles which have the same symptom, you will see the message "NO OTHER OCCURRENCES".

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- a) Push the line select key adjacent to < INDEX to go back to the CURRENT STATUS page.
- 5) If it is necessary to go back to the MAIN MENU page for the APU BITE TEST, push the line select key adjacent to < INDEX.
- (h) If it is necessary to see the FAULT HISTORY page from the MAIN MENU page, push the line select key adjacent to < FAULT HISTORY.

**NOTE:** The FAULT HISTORY page shows a list of all APU protective shutdowns with the date, Greenwich mean time (GMT) and APU cycle the fault(s) occurred. If you replace the electronic control unit from a different airplane, the FAULT HISTORY page can contain APU engine problems from the different airplane.

- 1) If you see the ">" symbol adjacent to CURRENT STATUS (CURRENT STATUS >) on this page, the fault message(s) are active.
  - a) Push the line select key adjacent to CURRENT STATUS > to see the symptom(s) that cause the APU protective shutdown.
- 2) If you do not see CURRENT STATUS > on this page, the fault message(s) are intermittent.
- 3) If it is necessary to see other APU cycles which have the same APU protective shutdown, push the line select key adjacent to OTHER OCCURRENCES > .

**NOTE:** If there are no other APU cycles which have the same APU protective shutdown, you will see the message "NO OTHER OCCURRENCES".

- a) Push the line select key adjacent to < INDEX to go back to the FAULT HISTORY page.
- 4) If there are more than one FAULT HISTORY page, push the previous page key (PREV PAGE) or next page key (NEXT PAGE) to go to the other pages.

**NOTE:** The number of pages are shown on the top right side of the FAULT HISTORY page.

- 5) If it is necessary to go back to the MAIN MENU page for the APU BITE TEST, push the line select key adjacent to < INDEX.
- (i) If it is necessary to see the MAINTENANCE HISTORY page from the MAIN MENU page, push the line select key adjacent to MAINTENANCE HISTORY > .

**NOTE:** The MAINTENANCE HISTORY page shows a list of a maximum of 99 maintenance messages (symptoms) with the date, Greenwich mean time (GMT) and APU cycle the symptom(s) occurred. If you replace the electronic control unit from a different airplane, the MAINTENANCE HISTORY page can contain APU engine problems from the different airplane.

- 1) If you see the ">" symbol adjacent to CURRENT STATUS (CURRENT STATUS >) on this page, the maintenance message(s) are active.
  - a) Push the line select key adjacent to CURRENT STATUS > to see the symptom(s) that cause the line replaceable unit (LRU) with the problem.
- 2) If you do not see CURRENT STATUS > on this page, the maintenance message(s) are intermittent.
- 3) If it is necessary to see other APU cycles which have the same symptom, push the line select key adjacent to OTHER OCCURRENCES > .

**NOTE:** If there are no other APU cycles which have the same symptom, you will see the message "NO OTHER OCCURRENCES".

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- a) Push the line select key adjacent to < INDEX to go back to the MAINTENANCE HISTORY page.
- 4) If there are more than one MAINTENANCE HISTORY page, push the previous page key (PREV PAGE) or next page key (NEXT PAGE) to go to the other pages.  
NOTE: The number of pages are shown on the top right side of the MAINTENANCE HISTORY page.
- 5) If it is necessary to go back to the MAIN MENU page for the APU BITE TEST, push the line select key adjacent to < INDEX.
- (j) If it is necessary to see the IDENT/CONFIG page from the MAIN MENU page, push the line select key adjacent to < IDENT/CONFIG.

NOTE: The IDENT/CONFIG page shows the two pages of APU and ECU identification/configuration data.

- 1) The first page shows these APU data:
  - a) APU serial number (APU S/N)
  - b) Hours of APU operation (APU HOURS)
  - c) APU cycles (APU CYCLES)
  - d) Hours since installation on the airplane.
- 2) If it is necessary to erase the data for the APU hours and set the APU hours to 0.0, push the line select key adjacent to RESET HOURS SINCE INSTALLATION > .

NOTE: A question "DO YOU WANT TO RESET THE HOURS SINCE INSTALLATION ON THIS AIRPLANE?" shows on the CDU display.

- a) If it is not necessary to set the APU hours to 0.0, push the line select key adjacent to NO > .
- b) If it is necessary to set the APU hours to 0.0, push the line select key adjacent to YES > .
- 3) Push the next page key (NEXT PAGE) to go to the second page which shows these ECU data:
  - a) Part number for the ECU hardware (ECU HW P/N)
  - b) ECU serial number (ECU S/N)
  - c) Part number for the ECU software (ECU OPERATIONAL SW P/N).

### HAP ALL; AIRPLANES WITH APU SOFTWARE PART NUMBER 491A-TUS-A04-00 and on.

- d) Status of the maintenance light for low oil quantity.
- e) Status of ice logic.

### HAP ALL

- 4) If it is necessary to see the program data for the data memory module, push the line select adjacent to DATA MEMORY MODULE > .

NOTE: The DATA MEMORY MODULE page shows on the CDU display.

- a) Push the previous page key (PREV PAGE) or next page key (NEXT PAGE) to go to the other pages.

NOTE: The number of pages are shown on the top right side of the DATA MEMORY MODULE page.

- b) Push the line select key adjacent to < INDEX to go back to the IDENT/CONFIG page.

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- 5) If it is necessary to go back to the MAIN MENU page for the APU BITE TEST, push the line select key adjacent to < INDEX.
- (k) If it is necessary to see the INPUT MONITORING page from the MAIN MENU page, push the line select key adjacent to < INPUT MONITORING.

**NOTE:** The INPUT MONITORING page shows these four pages of APU engine data.

- 1) The first page shows these APU engine data:
- a) APU speed (SPEED) (%)
  - b) Exhaust gas temperature, T5 (EGT) (°C)
  - c) Position of the inlet guide vanes (IGV POSITION) (degrees)
  - d) Position of the surge control valve (SCV POSITION) (degrees)
  - e) Delta pressure from the delta pressure sensor (DP) (DELTA PRESS) (psid)
  - f) Total pressure from the total pressure sensor (PT) (TOTAL PRESS) (psia)
  - g) Inlet pressure from the inlet pressure sensor (P2) (INLET PRESS) (psia)
  - h) Inlet temperature from the inlet temperature sensor (T2) (INLET TEMP) (°C)
  - i) Fuel torquemotor current from the fuel control unit (FUEL TMC) (milliamperes)
  - j) Fuel flow (FUEL FLOW) (pounds for each hour).
- 2) Push the next page key (NEXT PAGE) to go to the second page which shows these APU engine data:
- a) Oil temperature (OIL TEMP) (°C)
  - b) Fuel temperature (FUEL TEMP) (°C)
  - c) APU starter-generator load (GENERATOR LOAD) (KW)
  - d) APU master switch in the START position (START SWITCH) (YES/NO)
  - e) APU master switch in the ON position (APU ON SWITCH) (YES/NO)
  - f) APU master switch in the OFF position (APU OFF SWITCH) (YES/NO)
  - g) Position of the ENGINE START 1 and 2 switches on the P5 forward overhead panel (MES SWITCH(S))

**NOTE:** If ENGINE START 1 and 2 switches are in the OFF position, the CDU display shows "OFF". If ENGINE START 1 switch is in the GRD position and ENGINE START 2 switch is in the OFF position, the CDU display shows "1". If ENGINE START 1 switch is in the OFF position and ENGINE START 2 switch is in the GRD position, the CDU display shows "2". If ENGINE START 1 and 2 switches are in the GRD position, the CDU display shows "BOTH".

- h) Position of the air/ground switch (AIR/GROUND) (AIR/GND)
- i) Position of the L PACK switch (LEFT PACK)

**NOTE:** If the L PACK switch is in the OFF position, the CDU display shows "OFF". If the L PACK switch is in the AUTO position, the CDU display shows "LOW". If the L PACK switch is in the HIGH position, the CDU display shows "HIGH".

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- j) Position of the R PACK switch (RIGHT PACK).

NOTE: If the R PACK switch is in the OFF position, the CDU display shows "OFF". If the R PACK switch is in the AUTO position, the CDU display shows "LOW". If the R PACK switch is in the HIGH position, the CDU display shows "HIGH".

- 3) Push the next page key (NEXT PAGE) to go to the third page which shows these APU engine data:

- a) Position of the APU bleed switch (BLEED COMMAND SW) (ON/OFF)
- b) Air inlet door in the open position (INLET DOOR OPEN) (YES/NO)
- c) Air inlet door is not in the fully open position (DOOR NOT FULL OPEN) (YES/NO)
- d) APU fire switch (handle), S10, on the P8 aft electronic panel was pulled (FIRE COCKPIT) (YES/NO)
- e) APU remote fire switch (handle), S16, on the P28 APU remote control panel was pulled (FIRE REMOTE HANDLE) (YES/NO)
- f) Operation of the fire detection system (FIRE DETECTION) (YES/NO)
- g) Airplane model number (AIRPLANE MODEL) (600, 700 or 800)

NOTE: The 900 airplane model will show as 800.

- h) Position of the bleed air valve (BLEED AIR VALVE) (OPEN/CLOSE)
    - i) APU fuel shutoff valve in the closed position (FUEL VALVE CLOSED) (YES/NO)
    - j) APU fuel shutoff valve in the open position (FUEL VALVE OPEN) (YES/NO).
- 4) Push the next page key (NEXT PAGE) to go to the fourth page which shows these APU engine data:
- a) Received command signal to the ready to load circuit (READY TO LOAD) (YES/NO)
  - b) Received command signal to the start relay circuit (START COMMAND) (YES/NO)
  - c) Received command signal to the loadshed circuit (LOAD SHED COMMAND) (YES/NO)
  - d) Received command signal to the ignition unit circuit (IGNITION COMMAND) (YES/NO)
  - e) Received command signal to the solenoid for the fuel control unit (FUEL SOL COMMAND) (YES/NO)
  - f) Received command signal to the solenoid for the bleed air valve (BLEED SOL COMMAND) (YES/NO)
  - g) OVER SPEED light on the P5 forward overhead panel (OVERSPD INDICATOR) (ON/OFF)
  - h) FAULT light on the P5 forward overhead panel (FAULT INDICATOR) (ON/OFF)
  - i) LOW OIL PRESSURE light on the P5 forward overhead panel (LOP INDICATOR) (ON/OFF)
  - j) MAINT light on the P5 forward overhead panel (MAINT INDICATOR) (ON/OFF).
- 5) If it is necessary to go back to the MAIN MENU page for the APU BITE TEST, push the line select key adjacent to < INDEX.

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- (l) If it is necessary to see the OIL QUANTITY REPORT page from the MAIN MENU page, push the line select key adjacent to OIL QUANTITY > .

NOTE: The OIL QUANTITY REPORT page shows on the CDU display.

NOTE: To get an accurate indication, you must examine the APU oil level in the no APU operation (APU shutdown) condition.

### HAP ALL; AIRPLANES WITH APU SOFTWARE PART NUMBER PRIOR TO 491A-TUS-A04-00

- 1) The oil level will show ADD, LOW or FULL.

If the oil level shows ADD or LOW, you will see the APU hours from the first time the ECU senses this ADD or LOW oil condition.

- 2) If the oil level shows FULL, you will not see the APU hours for a FULL oil condition.

### HAP ALL; AIRPLANES WITH APU SOFTWARE PART NUMBER 491A-TUS-A04-00 and on.

- 3) The oil level will show UNKNOWN, WAIT, ADD, LOW or FULL.

If the oil level shows UNKNOWN, the APU is operating or it has been longer than one hour since the APU was shutdown. UNKNOWN will also be displayed when the APU and main engines are operating on the ground or during a sensor failure.

If the oil level shows WAIT, it has been less than two minutes since the APU was shutdown.

### HAP ALL

- 4) If it is necessary to go back to the MAIN MENU page for the APU BITE TEST, push the line select key adjacent to < INDEX.

- (m) If it is necessary to see other airplane MAINT BITE systems, push the line select key adjacent to < INDEX on the MAIN MENU page for the APU BITE TEST.

NOTE: The MAINT BITE INDEX page for the other airplane systems shows on the CDU display.

————— END OF TASK —————

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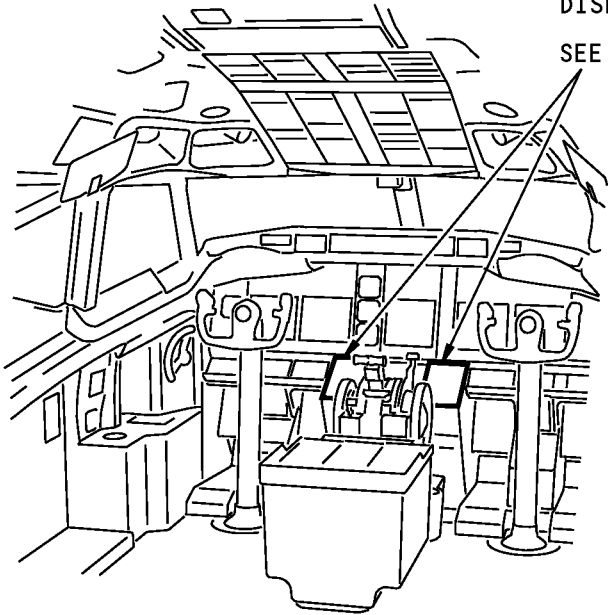
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FMCS CONTROL  
DISPLAY UNITS (CDU)



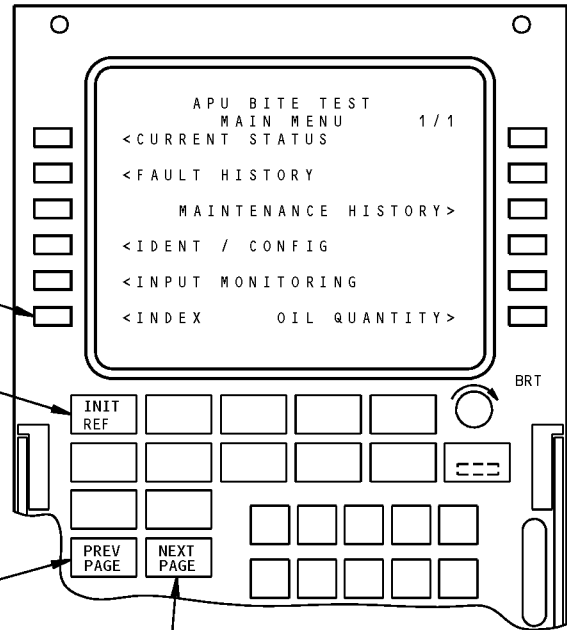
**FLIGHT COMPARTMENT**

LINE SELECT KEY (LSK)  
(12 LOCATIONS)

INIT REF  
FUNCTION KEY

PREVIOUS  
PAGE KEY

NEXT PAGE KEY



**FMCS CONTROL DISPLAY UNIT (CDU)**

(A)

**APU BITE Procedure**  
**Figure 201/49-61-00-990-801**

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**TASK 49-61-00-710-801**

## 3. APU Controls Operational Check

(Figure 201)

### A. General

(1) This procedure is a scheduled maintenance task.

### B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

### C. Procedure

SUBTASK 49-61-00-740-006

(1) Do an APU controls operational check from the MAIN MENU page for the APU BITE TEST:

(a) If you get access to the CDU for the first time or were in an airplane system other than the APU, push the INIT REF function key until the PERF INT page shows on the CDU display.

NOTE: The PERF INT page or IDENT page can show on the CDU display.

(b) If you see the PERF INT or IDENT page, push the line select key adjacent to < INDEX.

NOTE: The INIT/REF INDEX page shows on the CDU display.

(c) If you see the INIT/REF INDEX page, push the line select key adjacent to MAINT > .

NOTE: The MAINT BITE INDEX page shows on the CDU display.

(d) If you see the MAINT BITE INDEX page, push the line select key adjacent to APU > .

NOTE: If the last APU shutdown or cycle was an APU protective shutdown and/or the FAULT light is on, the FAULT HISTORY page for the APU BITE TEST shows on the CDU display. The related problem(s) that caused the APU protective shutdown with the date, Greenwich mean time (GMT) and APU cycle will show on this page.

NOTE: If the MAINT light is on, the CURRENT STATUS page for the APU BITE TEST shows on the CDU display. The related problem(s) that caused the MAINT light to come on will show on this page.

NOTE: If the FAULT and MAINT lights are off and there are no APU protective shutdowns, the MAIN MENU page for the APU BITE TEST shows on the CDU display. You can find the FAULT and MAINT lights on the P5 forward overhead panel.

(e) If you see the FAULT HISTORY page for the APU BITE TEST, push the line select key adjacent to < INDEX to go back to the MAIN MENU page for the APU BITE TEST.

NOTE: The MAIN MENU page shows on the CDU display.

(f) If you see the CURRENT STATUS page for the APU BITE TEST, push the line select key adjacent to < INDEX to go back to the MAIN MENU page for the APU BITE TEST.

NOTE: The MAIN MENU page shows on the CDU display.

(g) When the MAIN MENU page for the APU BITE TEST shows on the CDU display, push the line select key adjacent to < IDENT/CONFIG.

NOTE: The IDENT/CONFIG page shows the first page of two pages of APU and ECU identification/configuration data.

1) The first page shows these APU data:

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- a) APU serial number (APU S/N)
  - b) Hours of APU operation (APU HOURS)
  - c) APU cycles (APU CYCLES)
  - d) Hours since installation on the airplane.
- 2) Make sure there is identification and configuration data for the APU.
  - 3) Push the next page key (NEXT PAGE) to go to the second page which shows these ECU data:
    - a) Part number for the ECU hardware (ECU HW P/N)
    - b) ECU serial number (ECU S/N)
    - c) Part number for the ECU software (ECU OPERATIONAL SW P/N).
  - 4) Make sure there is configuration data for the ECU.
- (h) Push the line select key adjacent to < INDEX to go back to the MAIN MENU page for the APU BITE TEST.

NOTE: The MAIN MENU page shows on the CDU display.

- (i) Push the line select key adjacent to < INPUT MONITORING.

NOTE: The INPUT MONITORING page shows the first page of four pages of APU engine data.

- 1) The first page shows these APU engine data:
    - a) APU speed (SPEED) (%)
    - b) Exhaust gas temperature, T5 (EGT) (°C).
  - 2) If there is an APU operation, make sure there is operational data for the speed sensor and two EGT thermocouples.
- (j) Push the line select key adjacent to < INDEX to go back to the MAIN MENU page for the APU BITE TEST.

NOTE: The MAIN MENU page shows on the CDU display.

- (k) If it is necessary to see other airplane MAINT BITE systems, push the line select key adjacent to < INDEX on the MAIN MENU page for the APU BITE TEST.

NOTE: The MAINT BITE INDEX page for the other airplane systems shows on the CDU display.

————— END OF TASK —————

HAP 031-054, 101-999

**TASK 49-61-00-470-801**

#### 4. ECU Software Installation with an Airborne Data Loader

##### A. General

- (1) This procedure tells you how to install the ECU software into the ECU with the use of an airborne data loader (ADL).
- (2) An airborne data loader and a control display unit (CDU) are necessary for this procedure. A data loader control panel is also necessary. The data loader control panel is installed above the airborne data loader on the P61 panel.
- (3) The airplane must be on the ground with the APU and engines shutdown before you can install the ECU software.

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- (4) Some airlines keep the circuit breaker for the data loader open when the data loader is not necessary. This increases the length of time that the data loader is serviceable.
- (5) To read about software installation times and data loaders, do this task: On-Airplane Software Installation, TASK 20-15-11-400-801.

#### B. References

Reference	Title
20-15-11-400-801	On-Airplane Software Installation (P/B 201)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

#### C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

#### D. Procedure

SUBTASK 49-61-00-860-006

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF.

SUBTASK 49-61-00-860-001

- (2) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 49-61-00-860-007

- (3) Make sure that this circuit breaker is closed:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 49-61-00-940-003

- (4) Do these steps to prepare for the ECU software installation:

**NOTE:** Make sure you know the correct software part number for the ECU. For the ECU to be an approved installation, the correct software part number must be installed.

- (a) Make sure the system select switch on the data loader control panel (P61) is set to NORM or NORMAL.
- (b) Set the APU master switch to the ON position.
- (c) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
- (d) Make sure you get access to the IDENT/CONFIG page from the MAIN MENU page.

**NOTE:** The IDENT/CONFIG page shows the two pages of APU and ECU identification/configuration data.

- (e) Do these steps at the data loader control panel:
  - 1) Set the upper switch to SINGLE SYS.
  - 2) Set the system select switch to the APU.
- (f) Continue the procedure.

**NOTE:** The APU BITE TEST will not operate during the ECU software installation.

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HAP 031-054, 101-999 (Continued)

SUBTASK 49-61-00-470-001

(5) Do these steps at the airborne data loader to install the ECU software:

- (a) Put the correct disk in the disk drive.
- (b) Follow the prompts on the data loader to complete the installation.
- (c) Remove the disk from the disk drive when the ECU software installation is completed.

NOTE: COMP, LOAD COMPLETE and TRANSF COMPLETE are examples of data loader prompts for a completed installation.

SUBTASK 49-61-00-740-002

(6) Do these steps to make sure the ECU software installation is correct:

- (a) Set the system select switch on the data loader control panel to NORM or NORMAL.
- (b) Make sure the APU BITE TEST shows on the CDU display.
  - 1) If the APU BITE TEST does not show on the CDU display, do this task: APU BITE Procedure, TASK 49-61-00-700-801.
- (c) Make sure you get access to the IDENT/CONFIG page from the MAIN MENU page.
- (d) Make sure you get access to the second page of the IDENT/CONFIG page.

NOTE: You push the next page key (NEXT PAGE) to go to the second page which shows the part number for the ECU software (ECU OPERATIONAL SW P/N).

- (e) Make sure the part number for the correct ECU software shows on the CDU.
- (f) Push the line select key adjacent to < INDEX to go to the MAIN MENU page.
- (g) Set the APU master switch to the OFF position.

**HAP 031-054, 101-999; AIRPLANES WITH APU SOFTWARE PART NUMBER PRIOR TO 491A-TUS-A04-00**

SUBTASK 49-61-00-040-002

(7) If necessary, do this task: Low Oil Quantity BITE Deactivation, TASK 49-61-00-040-801.

**HAP 031-054, 101-999; AIRPLANES WITH APU SOFTWARE PART NUMBER 491A-TUS-A04-00 and on.**

SUBTASK 49-61-00-040-005

(8) If deactivation of the Low Oil Quantity BITE is desired, do this task: Low Oil Quantity BITE Deactivation, TASK 49-61-00-040-801.

NOTE: The status of the Low Oil Quantity BITE function does not change when new software is installed.

(9) If the Low Oil Quantity BITE function was deactivated and you have installed a new version of the software and want the Low Oil Quantity BITE to function, do this task: Low Oil Quantity BITE Activation, TASK 49-61-00-440-801

**HAP 031-054, 101-999**

SUBTASK 49-61-00-860-003

(10) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

————— **END OF TASK** —————

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HAP 031-054, 101-999 (Continued)

HAP 001-013, 015-026, 028-030

TASK 49-61-00-470-802

## 5. ECU Software Installation with a Portable Data Loader

### A. General

- (1) This procedure tells you how to install the ECU software into the ECU with the use of a portable data loader (PDL).
- (2) A portable data loader and the control display unit (CDU) are necessary for this procedure. A data loader control panel and a PDL interface connector are also necessary. The data loader control panel is installed above the DATA TRANSFER UNIT RECEPTACLE connector on the P61 panel.
- (3) A PDL is not a Boeing supplied part. Refer to the PDL supplier for instructions for operation. PDLs have a disk drive for software installation from disks. Some PDLs have an internal mass storage device. If the software is stored in the PDL, then disks are not necessary.
- (4) The airplane must be on the ground with the APU and engines shutdown before you can install the ECU software.
- (5) To read about software installation times and data loaders, do this task: On-Airplane Software Installation, TASK 20-15-11-400-801.

### B. References

Reference	Title
20-15-11-400-801	On-Airplane Software Installation (P/B 201)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

### C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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HAP 001-013, 015-026, 028-030 (Continued)

Reference	Description
COM-1915	Data Loader - ARINC 615 (Part #: 11615-20, Supplier: 0D4J3, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -ALL, -BBJ) (Part #: 2231560-1-B, Supplier: 98571, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: 30100, Supplier: 0BAW0, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: 460048 (MODEL 2766), Supplier: 07342, A/P Effectivity: 737-300, -400, -500, -600, -700, -700ER, -800, -BBJ) (Part #: 465130-01-01, Supplier: 30782, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: 800-0631, Supplier: 1JSZ6, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER) (Part #: 964-0400-024, Supplier: 97896, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: 964-0400-055, Supplier: 97896, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: CEI-715-DL-2, Supplier: 0BPH5, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: P2K-615A-05, Supplier: 0BAW0, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: YV68A110, Supplier: F6151, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Opt Part #: 11615-02, Supplier: 0D4J3, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Opt Part #: 18000-02, Supplier: 0D4J3, A/P Effectivity: 737-ALL) (Opt Part #: 80000-03-01010203, Supplier: 0BAW0, A/P Effectivity: 737-ALL) (Opt Part #: 80000-04-01020301, Supplier: 0BAW0, A/P Effectivity: 737-ALL) (Opt Part #: 964-0400-020, Supplier: 97896, A/P Effectivity: 737-600, -700, -800) (Opt Part #: 964-0400-025, Supplier: 97896, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Procedure

SUBTASK 49-61-00-860-004

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 49-61-00-940-001

HAP 001-013, 015-026, 028-030; AIRPLANES WITH -222 THRU -999 ECU

(2) Do these steps to prepare for the ECU software installation:

NOTE: Make sure you know the correct software part number for the ECU. For the ECU to be an approved installation, the correct software part number must be installed.

HAP 001-013, 015-026, 028-030

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HAP 001-013, 015-026, 028-030 (Continued)

(3) Do these steps to prepare for the ECU software installation:

NOTE: Make sure you know the correct software part number for the ECU. For the ECU to be an approved installation, the correct software part number must be installed.

(a) Make sure the system select switch on the data loader control panel (P61) is set to NORM or NORMAL.

CAUTION: MAKE SURE THE CIRCUIT BREAKER FOR THE DATA LOADER IS OPEN BEFORE YOU CONNECT OR REMOVE THE DATA LOADER CABLE. IF THE CIRCUIT BREAKER IS NOT OPEN, DAMAGE TO EQUIPMENT CAN OCCUR.

(b) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

CAUTION: MAKE SURE THE POWER SWITCH FOR THE PORTABLE DATA LOADER IS SET TO THE OFF BEFORE YOU CONNECT OR REMOVE THE INTERFACE CABLE. IF THE POWER SWITCH IS NOT OFF, DAMAGE TO THE PORTABLE DATA LOADER CAN OCCUR.

(c) Connect the interface cable of the ARINC 615 data loader, COM-1915 to the DATA TRANSFER UNIT RECEPTACLE on the P61 auxiliary panel.

(d) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

(e) Set the APU master switch on the P5 forward overhead panel to the ON position.

(f) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

(g) Make sure you get access to the IDENT/CONFIG page from the MAIN MENU page.

NOTE: The IDENT/CONFIG page shows the two pages of APU and ECU identification/ configuration data.

HAP 001-011 PRE SB 737-31-1136; AIRPLANES WITH ONE SWITCH ON THE DATA LOADER CONTROL PANEL (P61)

(h) Set the system select switch on the data loader control panel to APU.

HAP 012, 013, 015-026, 028-030; HAP 001-011 POST SB 737-31-1136; AIRPLANES WITH TWO SWITCHES ON THE DATA LOADER CONTROL PANEL (P61)

(i) Do these steps at the data loader control panel:

- 1) Set the upper switch to SINGLE SYS.
- 2) Set the system select switch to the APU.

HAP 001-013, 015-026, 028-030

(j) Continue the procedure.

NOTE: The APU BITE TEST will not operate during the ECU software installation.

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HAP 001-013, 015-026, 028-030 (Continued)

### HAP 001-013, 015-026, 028-030; SOFTWARE INSTALLATION WITH A PDL DISK DRIVE

SUBTASK 49-61-00-470-002

(4) Do these steps to install the ECU software:

NOTE: For more information on how to use the data loader, refer to the supplier's instructions for the data loader.

- (a) Set the power switch on the data loader to the on position.
- (b) Put the correct disk in the disk drive.
- (c) Follow the prompts on the data loader to complete the installation.
- (d) Remove the disk from the disk drive when the ECU software installation is completed.

NOTE: COMP, LOAD COMPLETE and TRANSF COMPLETE are examples of data loader prompts for a completed installation.

### HAP 001-013, 015-026, 028-030; SOFTWARE INSTALLATION WITH A PDL MASS STORAGE DEVICE

SUBTASK 49-61-00-470-003

(5) Follow the PDL supplier instructions to install the software.

### HAP 001-013, 015-026, 028-030

SUBTASK 49-61-00-860-008

(6) Set the power switch on the data loader to the off position.

SUBTASK 49-61-00-740-003

(7) Do these steps to make sure the ECU software installation is correct:

- (a) Set the system select switch on the data loader control panel to NORM or NORMAL.
- (b) Make sure the APU BITE TEST shows on the CDU display.
  - 1) If the APU BITE TEST does not show on the CDU display, do this task: APU BITE Procedure, TASK 49-61-00-700-801.
- (c) Make sure you get access to the IDENT/CONFIG page from the MAIN MENU page.
- (d) Make sure you get access to the second page of the IDENT/CONFIG page.

NOTE: You push the next page key (NEXT PAGE) to go to the second page which shows the part number for the ECU software (ECU OPERATIONAL SW P/N).

- (e) Make sure the part number for the correct ECU software shows on the CDU.
- (f) Push the line select key adjacent to < INDEX to go to the MAIN MENU page.
- (g) Set the APU master switch to the OFF position.

### HAP 001-013, 015-026, 028-030; AIRPLANES WITH APU SOFTWARE PART NUMBER PRIOR TO 491A-TUS-A04-00

SUBTASK 49-61-00-040-003

(8) If necessary, do this task: Low Oil Quantity BITE Deactivation, TASK 49-61-00-040-801.

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HAP 001-013, 015-026, 028-030; AIRPLANES WITH APU SOFTWARE PART NUMBER PRIOR TO 491A-TUS-A04-00 (Continued)

HAP 001-013, 015-026, 028-030; AIRPLANES WITH APU SOFTWARE PART NUMBER 491A-TUS-A04-00 and on.

SUBTASK 49-61-00-040-006

- (9) If deactivation of the Low Oil Quantity BITE is desired, do this task: Low Oil Quantity BITE Deactivation, TASK 49-61-00-040-801.

NOTE: The status of the Low Oil Quantity BITE function does not change when new software is installed.

- (10) If the Low Oil Quantity BITE function was deactivated and you have installed a new version of the software and want the Low Oil Quantity BITE to function, do this task: Low Oil Quantity BITE Activation, TASK 49-61-00-440-801

HAP 001-013, 015-026, 028-030

SUBTASK 49-61-00-940-002

- (11) Do these steps to put the airplane back to its usual condition:

CAUTION: MAKE SURE THE CIRCUIT BREAKER FOR THE DATA LOADER IS OPEN BEFORE YOU CONNECT OR REMOVE THE DATA LOADER CABLE. IF THE CIRCUIT BREAKER IS NOT OPEN, DAMAGE TO EQUIPMENT CAN OCCUR.

- (a) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-2

Table with 4 columns: Row, Col, Number, Name. Row A, Col 9, Number C00923, Name DATA LOADER

- (b) Disconnect the interface cable from the DATA TRANSFER UNIT RECEPTACLE on the P61 auxiliary panel.

- (c) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

Table with 4 columns: Row, Col, Number, Name. Row A, Col 9, Number C00923, Name DATA LOADER

SUBTASK 49-61-00-860-005

- (12) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

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END OF TASK

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**TASK 49-61-00-040-801**

## 6. Low Oil Quantity BITE Deactivation

A. General

### **HAP ALL; AIRPLANES WITH APU SOFTWARE PART NUMBER PRIOR TO 491A-TUS-A04-00**

- (1) This procedure tells you how to deactivate the MAINT light on the P5 forward overhead panel for low oil quantity indication. It is necessary to deactivate the MAINT light because the MAINT light comes on when the quantity of oil in the APU gearbox is satisfactory during an airplane landing operation. Boeing Service Letter 737-SL-49-058 gives more data on the deactivation of the MAINT light and low oil quantity indication.

### **HAP ALL; AIRPLANES WITH APU SOFTWARE PART NUMBER 491A-TUS-A04-00 and on.**

- (2) This procedure tells you how to deactivate the MAINT light on the P5 forward overhead panel for low oil quantity indication.

### **HAP ALL**

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Procedure

SUBTASK 49-61-00-740-004

- (1) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

### **HAP ALL; AIRPLANES WITH APU SOFTWARE PART NUMBER PRIOR TO 491A-TUS-A04-00**

SUBTASK 49-61-00-040-001

- (2) Do these steps to deactivate the MAINT light for low oil quantity indication:
  - (a) Make sure you get access to the OIL QUANTITY REPORT page from the MAIN MENU page.  
NOTE: The OIL QUANTITY REPORT page shows the oil level data on the CDU display.
  - (b) Use the keyboard on the CDU to type this on the scratch pad: LOQDISABLE.
  - (c) Push the line select key at the top right side of the CDU.  
NOTE: The message "MAINTENANCE LIGHT WILL BE OFF WITH LOW OIL QUANTITY DETECTION" will show on the CDU display.
  - (d) Push the line select key adjacent to < INDEX to go back to the MAIN MENU page for the APU BITE TEST.  
NOTE: The MAIN MENU page shows on the CDU display.

### **HAP ALL; AIRPLANES WITH APU SOFTWARE PART NUMBER 491A-TUS-A04-00 and on.**

SUBTASK 49-61-00-040-007

- (3) Do these steps to deactivate the MAINT light for low oil quantity indication:
  - (a) Make sure you get access to the IDENT CONFIG page 2 from the MAIN MENU page.
  - (b) Use the keyboard on the CDU to type this on the scratch pad: LOQOFF.
  - (c) Push the line select key at the top right side of the CDU.  
NOTE: The message "MAINT LIGHT FOR LOQ OFF" will show on the CDU display.

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HAP ALL; AIRPLANES WITH APU SOFTWARE PART NUMBER 491A-TUS-A04-00 and on. (Continued)

- (d) Push the line select key adjacent to < INDEX two times to go back to the MAIN MENU page for the APU BITE TEST.

NOTE: The MAIN MENU page shows on the CDU display.

HAP ALL

END OF TASK

TASK 49-61-00-440-801

7. Low Oil Quantity BITE Activation

A. General

- (1) This procedure tells you how to activate the MAINT light on the P5 forward overhead panel for low oil quantity indication.

B. Location Zones

Table with 2 columns: Zone, Area. Rows: 211 Flight Compartment - Left, 212 Flight Compartment - Right

C. Procedure

SUBTASK 49-61-00-740-005

- (1) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

HAP ALL; AIRPLANES WITH APU SOFTWARE PART NUMBER PRIOR TO 491A-TUS-A04-00

SUBTASK 49-61-00-440-001

- (2) Do these steps to activate the MAINT light for low oil quantity indication: (a) Make sure you get access to the OIL QUANTITY REPORT page from the MAIN MENU page. (b) Use the keyboard on the CDU to type this on the scratch pad: LOQENABLE. (c) Push the line select key at the top right side of the CDU.

NOTE: The OIL QUANTITY REPORT page shows the oil level data on the CDU display. NOTE: The message "MAINTENANCE LIGHT WILL BE ON WITH LOW OIL QUANTITY DETECTION" will show on the CDU display.

- (d) Push the line select key adjacent to < INDEX to go back to the MAIN MENU page for the APU BITE TEST.

NOTE: The MAIN MENU page shows on the CDU display.

HAP ALL; AIRPLANES WITH APU SOFTWARE PART NUMBER 491A-TUS-A04-00 and on.

SUBTASK 49-61-00-440-003

- (3) Do these steps to activate the MAINT light for low oil quantity indication: (a) Make sure you get access to the IDENT CONFIG page 2 from the MAIN MENU page. (b) Use the keyboard on the CDU to type this on the scratch pad: LOQON. (c) Push the line select key at the top right side of the CDU.

NOTE: The message "MAINT LIGHT FOR LOQ ON" will show on the CDU display.

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HAP ALL; AIRPLANES WITH APU SOFTWARE PART NUMBER 491A-TUS-A04-00 and on. (Continued)

- (d) Push the line select key adjacent to < INDEX two times to go back to the MAIN MENU page for the APU BITE TEST.

NOTE: The MAIN MENU page shows on the CDU display.

END OF TASK

TASK 49-61-00-040-802

8. Ice Logic Deactivation

A. General

- (1) This procedure tells you how to deactivate the ICE LOGIC on the current status page.

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Procedure

SUBTASK 49-61-00-740-007

- (1) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

SUBTASK 49-61-00-040-004

- (2) Do these steps to deactivate the ICE LOGIC:

- (a) Make sure you get access to the IDENT CONFIG page 2 from the MAIN MENU page.
- (b) Use the keyboard on the CDU to type this on the scratch pad: ICELOGICOFF.
- (c) Push the line select key at the top right side of the CDU.

NOTE: The message "ICE LOGIC OFF" will show on the CDU display.

- (d) Push the line select key adjacent to < INDEX to go back to the MAIN MENU page for the APU BITE TEST.

NOTE: The MAIN MENU page shows on the CDU display.

END OF TASK

TASK 49-61-00-440-802

9. Ice Logic Activation

A. General

- (1) This procedure tells you how to activate the ICE LOGIC.

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Procedure

SUBTASK 49-61-00-740-008

- (1) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

SUBTASK 49-61-00-440-002

- (2) Do these steps to activate the ICE LOGIC:

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**HAP ALL; AIRPLANES WITH APU SOFTWARE PART NUMBER 491A-TUS-A04-00 and on. (Continued)**

- (a) Make sure you get access to the IDENT CONFIG page 2 from the MAIN MENU page.
- (b) Use the keyboard on the CDU to type this on the scratch pad: ICELOGICON.
- (c) Push the line select key at the top right side of the CDU.

NOTE: The message "ICE LOGIC ON" will show on the CDU display.

- (d) Push the line select key adjacent to < INDEX to go back to the MAIN MENU page for the APU BITE TEST.

NOTE: The MAIN MENU page shows on the CDU display.

————— **END OF TASK** —————

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## ELECTRONIC CONTROL UNIT - REMOVAL/INSTALLATION

### 1. General

- A. This procedure has these tasks:
  - (1) A removal of the electronic control unit
  - (2) An installation of the electronic control unit.

#### **HAP 001-013, 015-026, 028-054**

- B. The electronic control unit is installed in the aft cargo compartment. The rack for the electronic control unit is found on the aft right side of the aft cargo compartment. You can find the cockpit voice recorder with the electronic control unit.

#### **HAP 101-999**

- C. The electronic control unit is installed on the E6-3 electrical shelf. The E6-3 electrical shelf is found on the aft right side of the aft cargo compartment.

#### **HAP ALL**

- D. If you must remove the electronic control unit and the data memory module (DMM) at the same time, you must replace the electronic control unit first and do the installation test for the electronic control unit. If you do not do the installation test for the electronic control unit before you remove the DMM, you will lose the data for the APU.
- E. The electronic control unit is referred to as the ECU.

#### **TASK 49-61-12-000-801**

### 2. Electronic Control Unit Removal

(Figure 401)

#### A. References

Reference	Title
20-10-07-000-801	E/E Box Removal (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

#### B. Location Zones

Zone	Area
142	Aft Cargo Compartment - Right
211	Flight Compartment - Left

#### C. Access Panels

Number	Name/Location
822	Aft Cargo Door

#### D. Prepare for the Removal

SUBTASK 49-61-12-740-001

**CAUTION:** DO NOT REMOVE THE ELECTRONIC CONTROL UNIT UNTIL YOU DO THE APU BITE PROCEDURE AND LOOK FOR THE MAINTENANCE MESSAGE(S) ON THE DATA MEMORY MODULE. IF YOU REPLACE THE ELECTRONIC CONTROL UNIT AND THERE IS A PROBLEM WITH THE DATA MEMORY MODULE, YOU WILL LOSE THESE APU DATA: APU SERIAL NUMBER, APU HOURS AND APU CYCLES.

- (1) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

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- (a) Get access to the CURRENT STATUS page from the MAIN MENU page for the APU BITE TEST.
- (b) If maintenance message(s) 49-61106, 49-61108, 49-72101, 49-72103, 49-72104 and/or 4972105 show on the CURRENT STATUS page, then do the fault isolation task(s) for these maintenance message(s) in the FIM.

SUBTASK 49-61-12-860-001

- (2) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-61-12-860-002

- (3) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-61-12-010-001

- (4) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
822	Aft Cargo Door

E. Procedure

SUBTASK 49-61-12-020-001

**CAUTION:** DO NOT REMOVE THE ELECTRONIC CONTROL UNIT AND THE DATA MEMORY MODULE AT THE SAME TIME. IF YOU REMOVE BOTH THE ELECTRONIC CONTROL UNIT AND THE DATA MEMORY MODULE AT THE SAME TIME, YOU WILL LOSE THE DATA FOR THE APU.

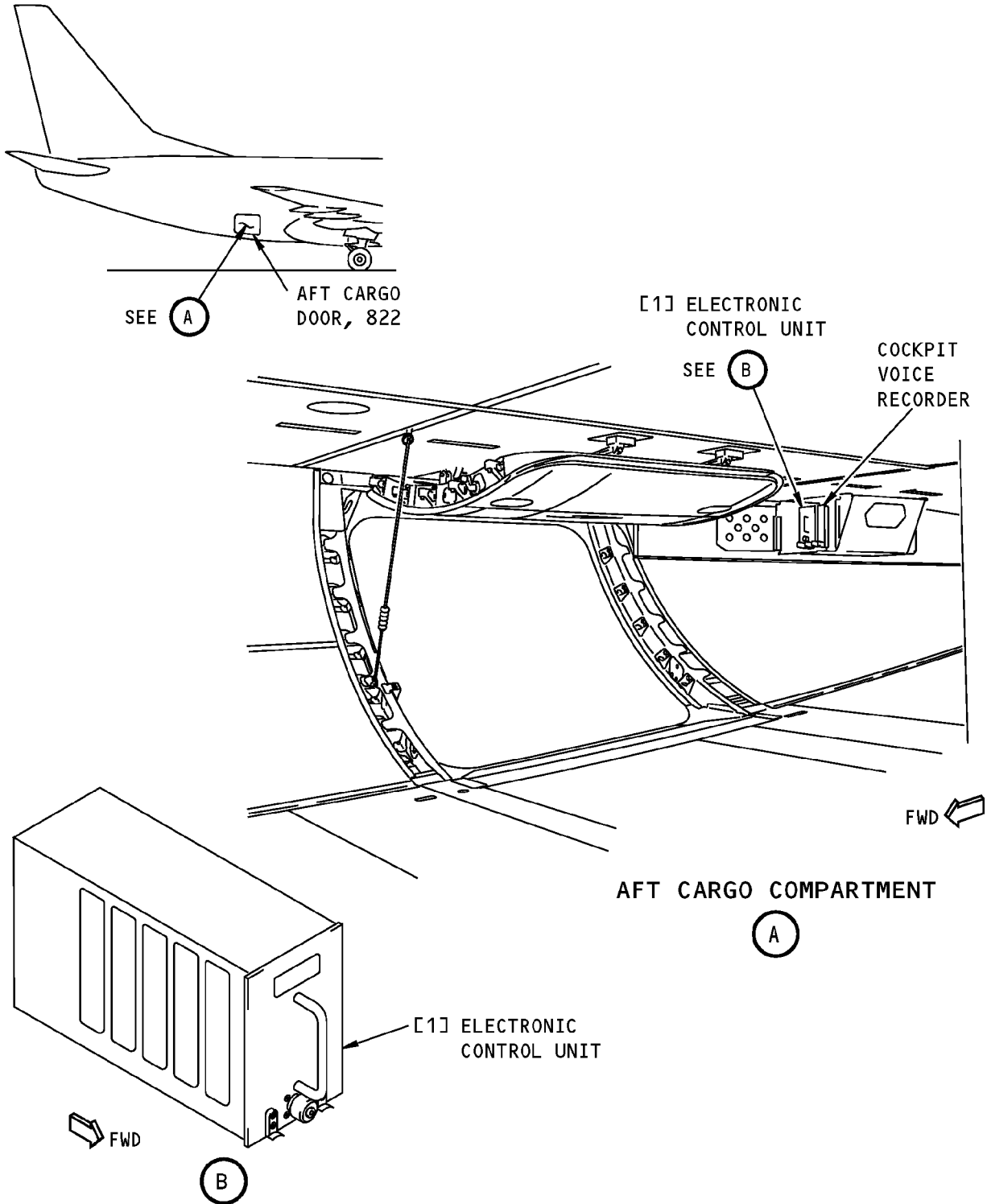
- (1) Remove the electronic control unit [1]. To remove it, do this task: E/E Box Removal, TASK 20-10-07-000-801.

**NOTE:** The electronic control unit is not sensitive to electrostatic discharge.

————— **END OF TASK** —————

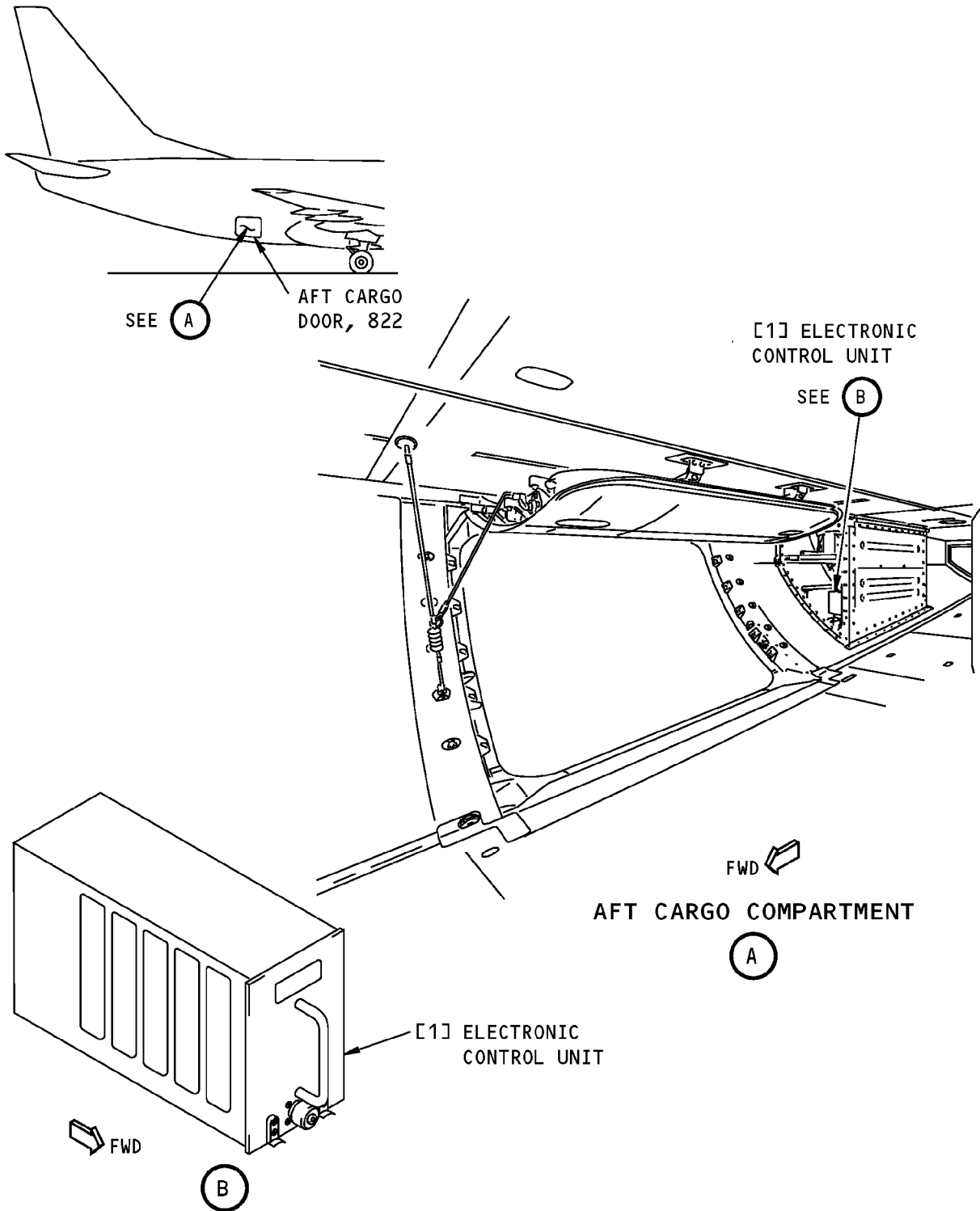
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**Electronic Control Unit Installation  
Figure 401 (Sheet 1 of 2)/49-61-12-990-801**

EFFECTIVITY  
HAP 001-013, 015-026, 028-054



**Electronic Control Unit Installation  
Figure 401 (Sheet 2 of 2)/49-61-12-990-801**

EFFECTIVITY  
HAP 101-999

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#### TASK 49-61-12-400-801

### 3. Electronic Control Unit Installation

(Figure 401)

#### A. References

Reference	Title
20-10-07-400-801	E/E Box Installation (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-470-801	ECU Software Installation with an Airborne Data Loader (P/B 201)
49-61-00-470-802	ECU Software Installation with a Portable Data Loader (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

#### B. Location Zones

Zone	Area
142	Aft Cargo Compartment - Right
211	Flight Compartment - Left

#### C. Access Panels

Number	Name/Location
822	Aft Cargo Door

#### D. Procedure

SUBTASK 49-61-12-420-001

- (1) Install the electronic control unit [1]. To install it, do this task: E/E Box Installation, TASK 20-10-07-400-801.

NOTE: The electronic control unit is not sensitive to electrostatic discharge.

#### E. Electronic Control Unit Installation Test

SUBTASK 49-61-12-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-61-12-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-61-12-710-001

- (3) Do the installation test for the electronic control unit:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

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- 1) If maintenance message(s) show for the APU controls system or the electronic control unit, refer to the applicable Maintenance Message Index in the FIM.
- 2) Do these steps to make sure the ECU software installation is correct:
  - a) Make sure you get access to the IDENT/CONFIG page from the MAIN MENU page.
  - b) Make sure you get access to the second page of the IDENT/CONFIG page.

NOTE: You push the next page key (NEXT PAGE) to go to the second page which shows the part number for the ECU software (ECU OPERATIONAL SW P/ N).

- c) Make sure the part number for the correct ECU software shows on the control display unit (CDU) display.
  - d) If the part number is not correct, do this task: ECU Software Installation with a Portable Data Loader, TASK 49-61-00-470-802 or ECU Software Installation with an Airborne Data Loader, TASK 49-61-00-470-801 or replace the ECU.
- (c) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

**F. Put the Airplane Back to Its Usual Condition**

SUBTASK 49-61-12-410-001

(1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
822	Aft Cargo Door

**END OF TASK**

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# AIRCRAFT MAINTENANCE MANUAL

## SPEED SENSOR - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the speed sensor
- (2) An installation of the speed sensor.

B. The speed sensor is installed aft of the APU gearbox at the 4 o'clock position.

#### **TASK 49-61-21-000-801**

### 2. Speed Sensor Removal

(Figure 401)

A. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
316	APU Compartment - Right

B. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

C. Prepare for the Removal

SUBTASK 49-61-21-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-61-21-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-61-21-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.

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- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### D. Speed Sensor Removal

SUBTASK 49-61-21-020-001

- (1) Do these steps to remove the speed sensor [2]:
  - (a) Disconnect the electrical connector (P12) [3] from the speed sensor [2].
  - (b) Loosen the nut [1] that attaches the speed sensor [2] to the APU.
  - (c) Turn the speed sensor [2] clockwise until the flange disengages from the stud.
  - (d) Remove the speed sensor [2].
  - (e) Remove the packing [4] and packing [5] from the speed sensor [2].
    - 1) Discard the packing [4] and packing [5].
  - (f) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

EFFECTIVITY  
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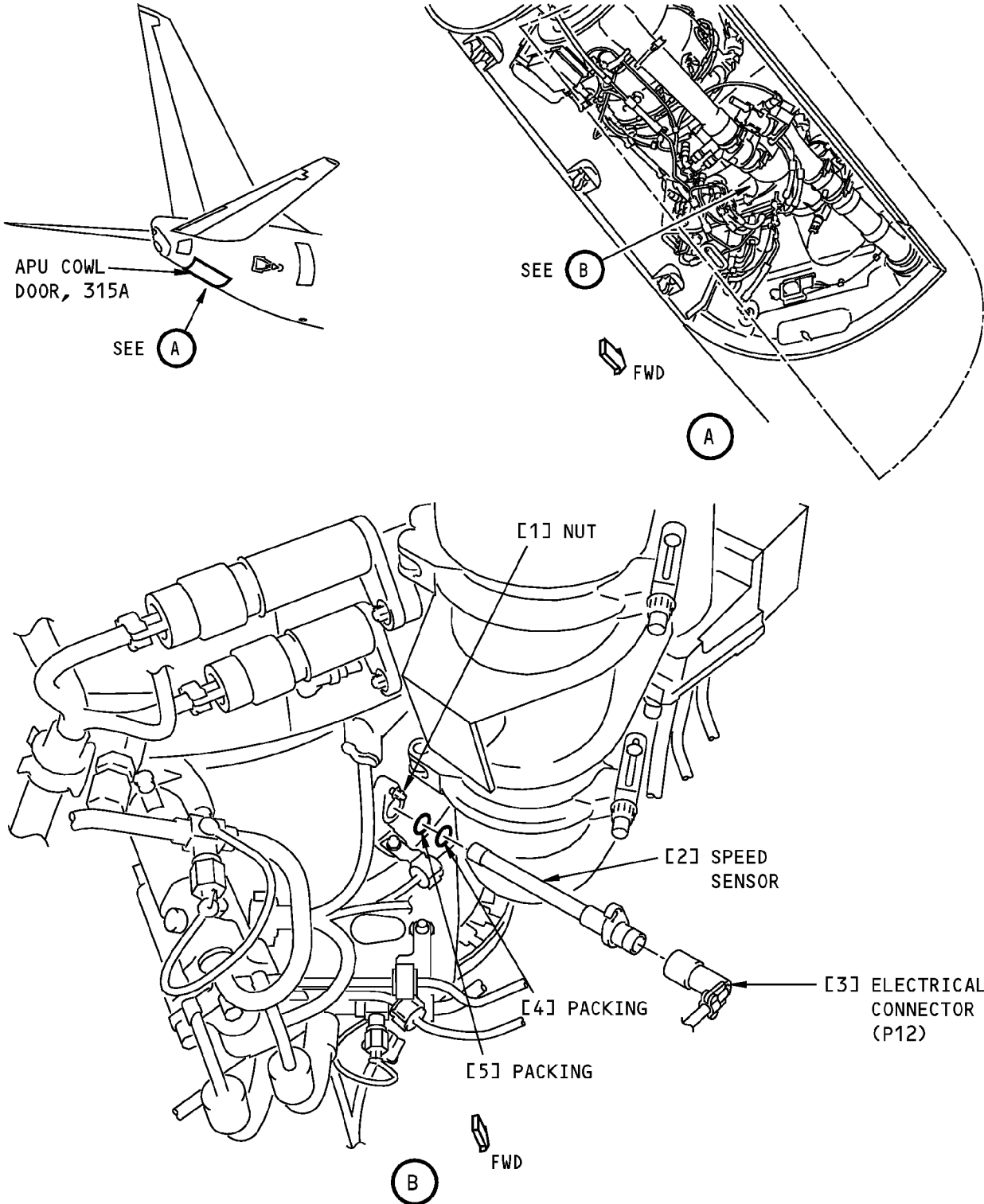
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**Speed Sensor Installation  
Figure 401/49-61-21-990-801**

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TASK 49-61-21-400-801

#### 3. Speed Sensor Installation

(Figure 401)

##### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

##### B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

##### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Speed sensor	49-61-21-01-010	HAP 001-013, 015-026, 028-030
4	Packing	49-61-21-02-010	HAP 031-054, 101-999
		49-61-21-01-020	HAP 001-013, 015-026, 028-030
5	Packing	49-61-21-02-020	HAP 031-054, 101-999
		49-61-21-01-015	HAP 001-013, 015-026, 028-030
		49-61-21-02-015	HAP 031-054, 101-999

##### D. Location Zones

Zone	Area
211	Flight Compartment - Left
316	APU Compartment - Right

##### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### F. Procedure

SUBTASK 49-61-21-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the speed sensor [2]:
  - (a) Lubricate the new packing [4] and new packing [5] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.
  - (b) Install the packing [4] and packing [5] on the speed sensor [2].
  - (c) Install the speed sensor [2].
  - (d) Turn the speed sensor [2] counterclockwise until the flange fully engages the stud.

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- (e) Tighten the nut [1] to 40 pound-inches (4.5 newton-meters).
- (f) Connect the electrical connector (P12) [3] to the speed sensor [2].

#### G. Speed Sensor Installation Test

SUBTASK 49-61-21-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-61-21-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-61-21-710-001

- (3) Do the installation test for the speed sensor:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Operate the APU for a minimum of five minutes.
  - (c) During the APU operation, examine the speed sensor for signs of oil leakage.
  - (d) If you find oil leakage, do these steps to repair the leakage:
    - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
    - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
    - 3) Repair the cause of the oil leakage.
    - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
    - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
    - 6) During the APU operation, examine the speed sensor for signs of oil leakage.
    - 7) If you find oil leakage, do the leakage repair again.
  - (e) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
    - 1) If maintenance message(s) show for the APU control system or the speed sensor, refer to the applicable Maintenance Message Index in the FIM.
  - (f) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

#### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-61-21-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.

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**AIRCRAFT MAINTENANCE MANUAL**

- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

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# AIRCRAFT MAINTENANCE MANUAL

## INLET TEMPERATURE SENSOR - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the inlet temperature sensor
- (2) An installation of the inlet temperature sensor.

B. The inlet temperature sensor (T2) is installed on the compressor inlet section of the APU at the 6 o'clock position.

#### **TASK 49-61-31-000-801**

### 2. Inlet Temperature Sensor Removal

(Figure 401)

A. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

B. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

C. Prepare for the Removal

SUBTASK 49-61-31-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-61-31-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-61-31-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.

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- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### D. Inlet Temperature Sensor Removal

SUBTASK 49-61-31-020-001

- (1) Do these steps to remove the inlet temperature sensor [2]:
  - (a) Disconnect the electrical connector (P21) [3] from the inlet temperature sensor [2].
  - (b) Hold the nut on the compressor inlet section while you remove the inlet temperature sensor [2].

NOTE: Turn the inlet temperature sensor [2] counterclockwise for the removal.

- (c) Remove the gasket [1] from the inlet temperature sensor [2].
  - 1) Discard the gasket [1].
- (d) Make sure you install all necessary protection covers.

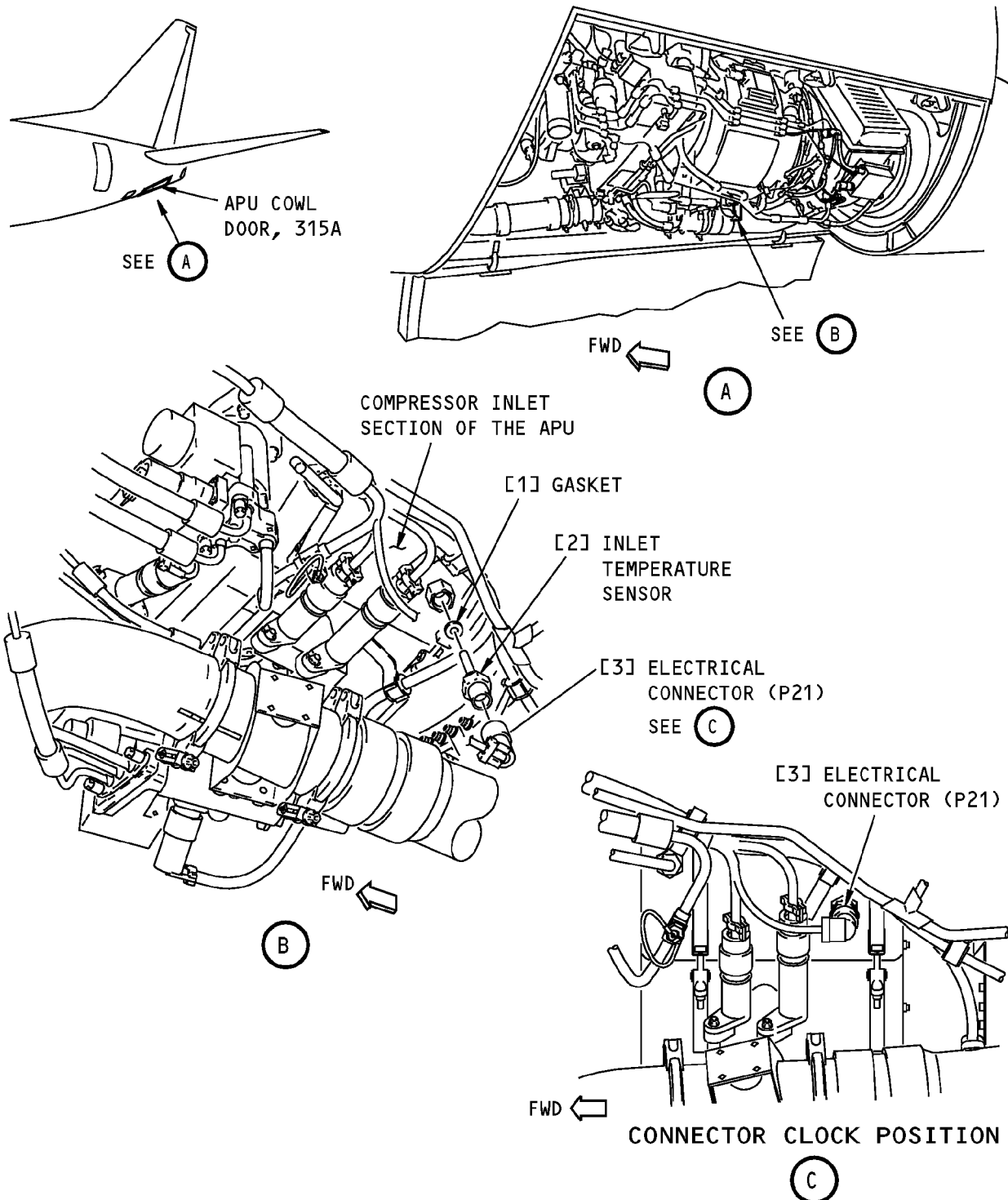
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**Inlet Temperature Sensor Installation  
Figure 401/49-61-31-990-801**

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#### TASK 49-61-31-400-801

### 3. Inlet Temperature Sensor Installation

(Figure 401)

#### A. References

Reference	Title
49-61-00-700-801	APU BITE Procedure (P/B 201)

#### B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236

#### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Gasket	49-61-31-01-010	HAP 001-013, 015-026, 028-030
2	Inlet temperature sensor	49-61-31-02-010	HAP 031-054, 101-999
		49-61-31-01-005	HAP 001-013, 015-026, 028-030
		49-61-31-02-005	HAP 031-054, 101-999

#### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### F. Procedure

SUBTASK 49-61-31-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the inlet temperature sensor [2]:
  - (a) Lubricate the new gasket [1] with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.
  - (b) Install the gasket [1] on the inlet temperature sensor [2].
  - (c) Install the inlet temperature sensor [2].

**NOTE:** Turn the inlet temperature sensor [2] clockwise for the installation.

- 1) Hold the nut on the compressor inlet section while you tighten the inlet temperature sensor [2] to 230 pound-inches (26.0 newton-meters).

**NOTE:** The clock position for the electrical connector (P21) [3] must be at the 9 o'clock position.

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(d) Connect the electrical connector (P21) [3] to the inlet temperature sensor [2].

#### G. Inlet Temperature Sensor Installation Test

SUBTASK 49-61-31-860-003

(1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-61-31-860-004

(2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-61-31-740-001

(3) Do the installation test for the inlet temperature sensor:

- (a) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
- (b) If maintenance message(s) show for the APU control system or the inlet temperature sensor (T2), refer to the applicable Maintenance Message Index in the FIM.

#### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-61-31-410-001

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— END OF TASK —————

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# AIRCRAFT MAINTENANCE MANUAL

## EXHAUST GAS TEMPERATURE INDICATOR - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the exhaust gas temperature indicator
- (2) An installation of the exhaust gas temperature indicator.

B. The exhaust gas temperature indicator is referred to as the EGT indicator.

C. The EGT indicator is installed on the P5 forward overhead panel.

### **TASK 49-71-11-000-801**

### 2. Exhaust Gas Temperature Indicator Removal

(Figure 401)

A. Location Zones

Zone	Area
211	Flight Compartment - Left

B. Prepare for the Removal

SUBTASK 49-71-11-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-71-11-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

C. Exhaust Gas Temperature Indicator Removal

SUBTASK 49-71-11-020-001

- (1) Do these steps to remove the indicator [3]:
  - (a) Turn the clamping screw [1] counterclockwise to loosen the indicator [3].
  - (b) Carefully pull the indicator [3] out of the P5 forward overhead panel.
  - (c) Disconnect the electrical connector [2] from the indicator [3].
    - 1) Install a cap on the electrical connector [2] to prevent contamination.
  - (d) Remove the indicator [3].

————— **END OF TASK** —————

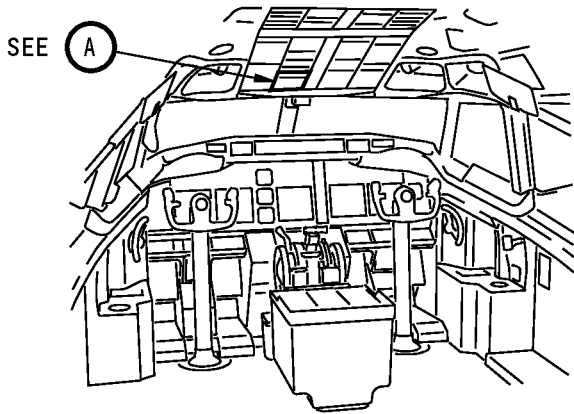
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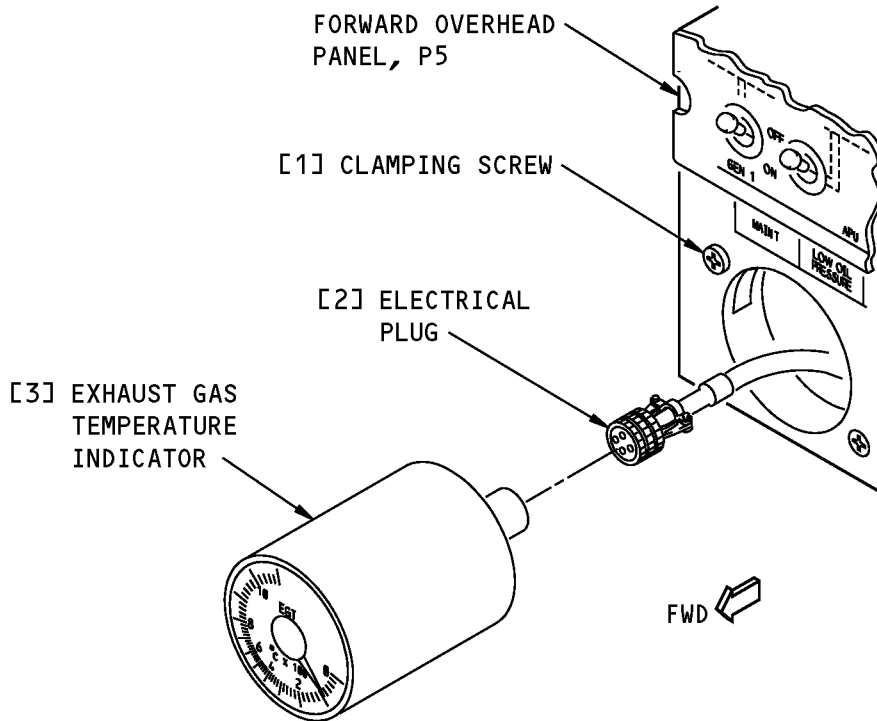
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**FLIGHT COMPARTMENT**



A

**Exhaust Gas Temperature Indicator Installation  
Figure 401/49-71-11-990-801**

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### AIRCRAFT MAINTENANCE MANUAL

#### TASK 49-71-11-400-801

### 3. Exhaust Gas Temperature Indicator Installation

(Figure 401)

#### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

#### B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Indicator	49-71-00-01-050	HAP 001-013, 015-026, 028
		49-71-51-01-005	HAP 029-054, 101-999

#### C. Location Zones

Zone	Area
211	Flight Compartment - Left

#### D. Procedure

SUBTASK 49-71-11-420-001

- (1) Do these steps to install the indicator [3]:
  - (a) Remove the cap from the electrical connector [2].
  - (b) Connect the electrical connector [2] to the indicator [3].
  - (c) Carefully install the indicator [3] in the P5 forward overhead panel.
  - (d) Turn the clamping screw [1] clockwise to tighten the indicator [3].

#### E. Exhaust Gas Temperature Indicator Test

SUBTASK 49-71-11-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-71-11-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-71-11-720-001

- (3) Do the installation test for the EGT indicator:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
    - 1) Look at the EGT indicator on the P5 forward overhead panel.
    - 2) Make sure that the EGT indicator shows a minimum of 250° C.

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- (b) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

————— **END OF TASK** —————

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## EXHAUST GAS TEMPERATURE THERMOCOUPLE - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the exhaust gas temperature thermocouple
- (2) An installation of the exhaust gas temperature thermocouple.

B. The exhaust gas temperature thermocouple is referred to as the EGT thermocouple.

C. Two EGT thermocouples are installed on the bottom of the turbine exhaust port.

### **TASK 49-71-21-000-801**

### 2. Exhaust Gas Temperature Thermocouple Removal

(Figure 401)

A. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

B. Access Panels

Number	Name/Location
315A	APU Cowl Door

C. Prepare for the Removal

SUBTASK 49-71-21-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-71-21-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-71-21-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.

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- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### D. Exhaust Gas Temperature Thermocouple Removal

SUBTASK 49-71-21-020-001

(1) Do these steps to remove the EGT thermocouple 1 [3] or EGT thermocouple 2 [6]:

- (a) Remove the two nuts [4] that attach the two EGT leads [5] to the EGT thermocouple 1 [3] or EGT thermocouple 2 [6].

NOTE: There are two different nuts that attach the two EGT leads to each thermocouple. The nut for the alumel stud is larger than the nut for the chromel stud.

- (b) Remove the two EGT leads [5].
- (c) Loosen the two nuts [1] that attach the EGT thermocouple 1 [3] or EGT thermocouple 2 [6] to the turbine exhaust port.
- (d) Turn the EGT thermocouple 1 [3] or EGT thermocouple 2 [6] clockwise until the flange disengages from the two studs.
- (e) Remove the EGT thermocouple 1 [3] or EGT thermocouple 2 [6].
- (f) Remove the gasket [2] from the EGT thermocouple 1 [3] or EGT thermocouple 2 [6].
- (g) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

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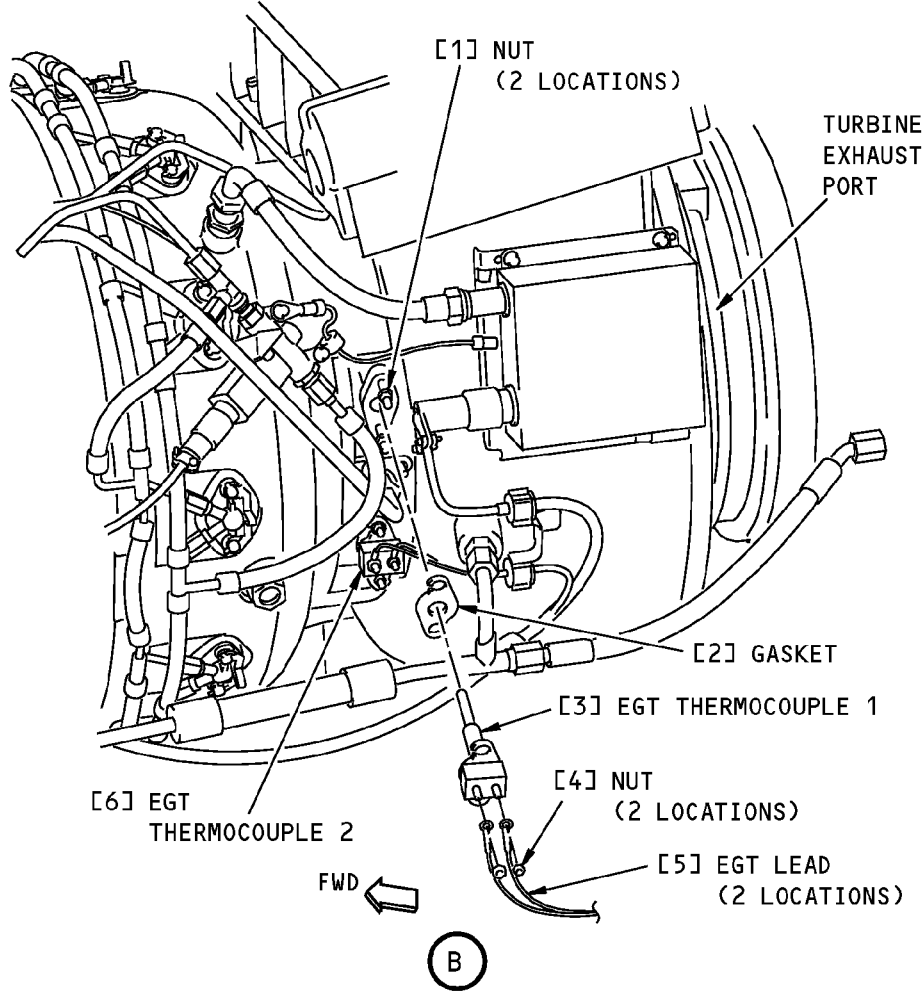
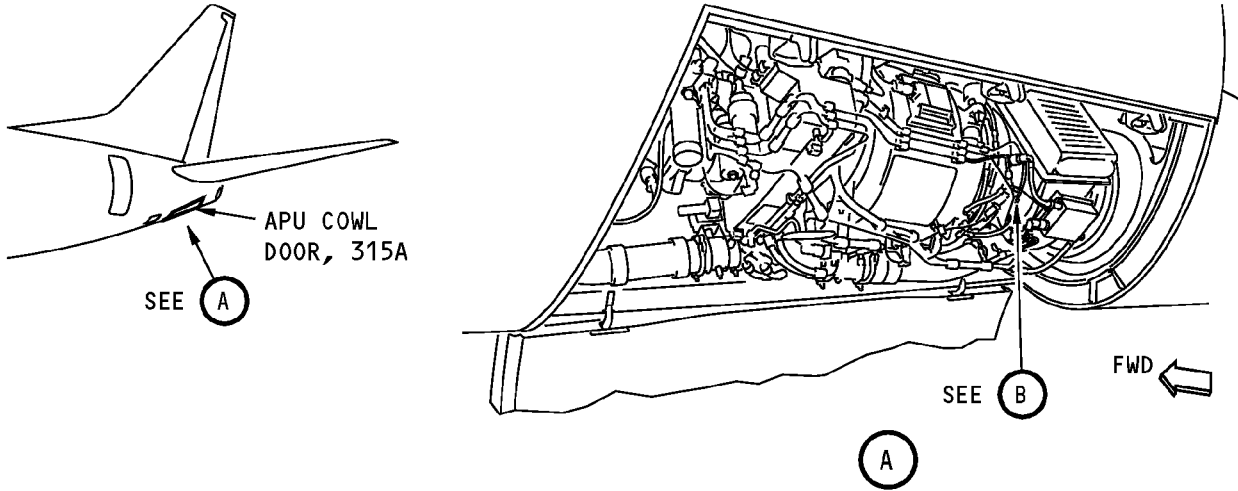
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**Exhaust Gas Temperature Thermocouple Installation  
Figure 401/49-71-21-990-801**

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#### TASK 49-71-21-400-801

### 3. Exhaust Gas Temperature Thermocouple Installation

(Figure 401)

#### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

#### B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Gasket	49-71-21-01-015	HAP 001-013, 015-026, 028-030
3	EGT thermocouple 1	49-71-21-02-015	HAP 031-054, 101-999
		49-71-21-01-010	HAP 001-013, 015-026, 028-030
6	EGT thermocouple 2	49-71-21-02-010	HAP 031-054, 101-999
		49-71-21-01-010	HAP 001-013, 015-026, 028-030
		49-71-21-02-010	HAP 031-054, 101-999

#### C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### D. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### E. Procedure

SUBTASK 49-71-21-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the EGT thermocouple 1 [3] or EGT thermocouple 2 [6]:
  - (a) Install the gasket [2] on the EGT thermocouple 1 [3] or EGT thermocouple 2 [6].
  - (b) Put the EGT thermocouple 1 [3] or EGT thermocouple 2 [6] in the turbine exhaust port.
  - (c) Turn the EGT thermocouple 1 [3] or EGT thermocouple 2 [6] counterclockwise until the flange fully engages the two studs.
  - (d) Tighten the two nuts [1] to 40 pound-inches (4.5 newton-meters).
  - (e) Connect the two EGT leads [5] to the EGT thermocouple 1 [3] or EGT thermocouple 2 [6].

**NOTE:** The alumel stud on the EGT thermocouple is larger than the chromel stud. Make sure the two EGT leads are connected to the correct studs.

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- (f) Install the two nuts [4] on the EGT thermocouple 1 [3] or EGT thermocouple 2 [6].

NOTE: There are two different nuts that attach the two EGT leads to each thermocouple. The nut for the alumel stud is larger than the nut for the chromel stud.

- 1) Tighten the nut [4] for the alumel stud to 24-40 pound-inches (2.7-4.5 newton-meters).
- 2) Tighten the nut [4] for the chromel stud to 15-20 pound-inches (1.7-2.3 newton-meters).

#### F. Exhaust Gas Temperature Thermocouple Installation Test

SUBTASK 49-71-21-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-71-21-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-71-21-740-001

- (3) Do the installation test for the EGT thermocouple 1 or EGT thermocouple 2:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
    - 1) If maintenance message(s) show for the APU EGT indicating system, EGT thermocouple 1 or EGT thermocouple 2, refer to the applicable Maintenance Message Index in the FIM.
  - (c) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

#### G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-71-21-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— END OF TASK —————

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## AIRCRAFT MAINTENANCE MANUAL

### DATA MEMORY MODULE - REMOVAL/INSTALLATION

#### 1. General

- A. This procedure has these tasks:
  - (1) A removal of the data memory module
  - (2) An installation of the data memory module.
- B. The data memory module (DMM) is installed on the compressor inlet section of the APU.
- C. If you must remove the DMM and the electronic control unit (ECU) at the same time, you must replace the ECU first and do the ECU installation test. If you do not do the ECU installation test before you remove the DMM, you will lose the data for the APU.

#### **TASK 49-72-11-000-801**

#### 2. Data Memory Module Removal

(Figure 401)

##### A. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

##### B. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### C. Prepare for the Removal

SUBTASK 49-72-11-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-72-11-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-72-11-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.

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- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### D. Data Memory Module Removal

SUBTASK 49-72-11-020-001

**CAUTION:** DO NOT REMOVE THE DATA MEMORY MODULE AND THE ELECTRONIC CONTROL UNIT AT THE SAME TIME. IF YOU REMOVE BOTH THE DATA MEMORY MODULE AND THE ELECTRONIC CONTROL UNIT AT THE SAME TIME, YOU WILL LOSE THE DATA FOR THE APU.

- (1) Do these steps to remove the data memory module [2]:
  - (a) Disconnect the electrical connector (P11) [1] from the data memory module [2].
  - (b) Remove the four bolts [3] and four washers [4] that attach the data memory module [2] to the bracket.
  - (c) Remove the data memory module [2] from the bracket.
  - (d) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

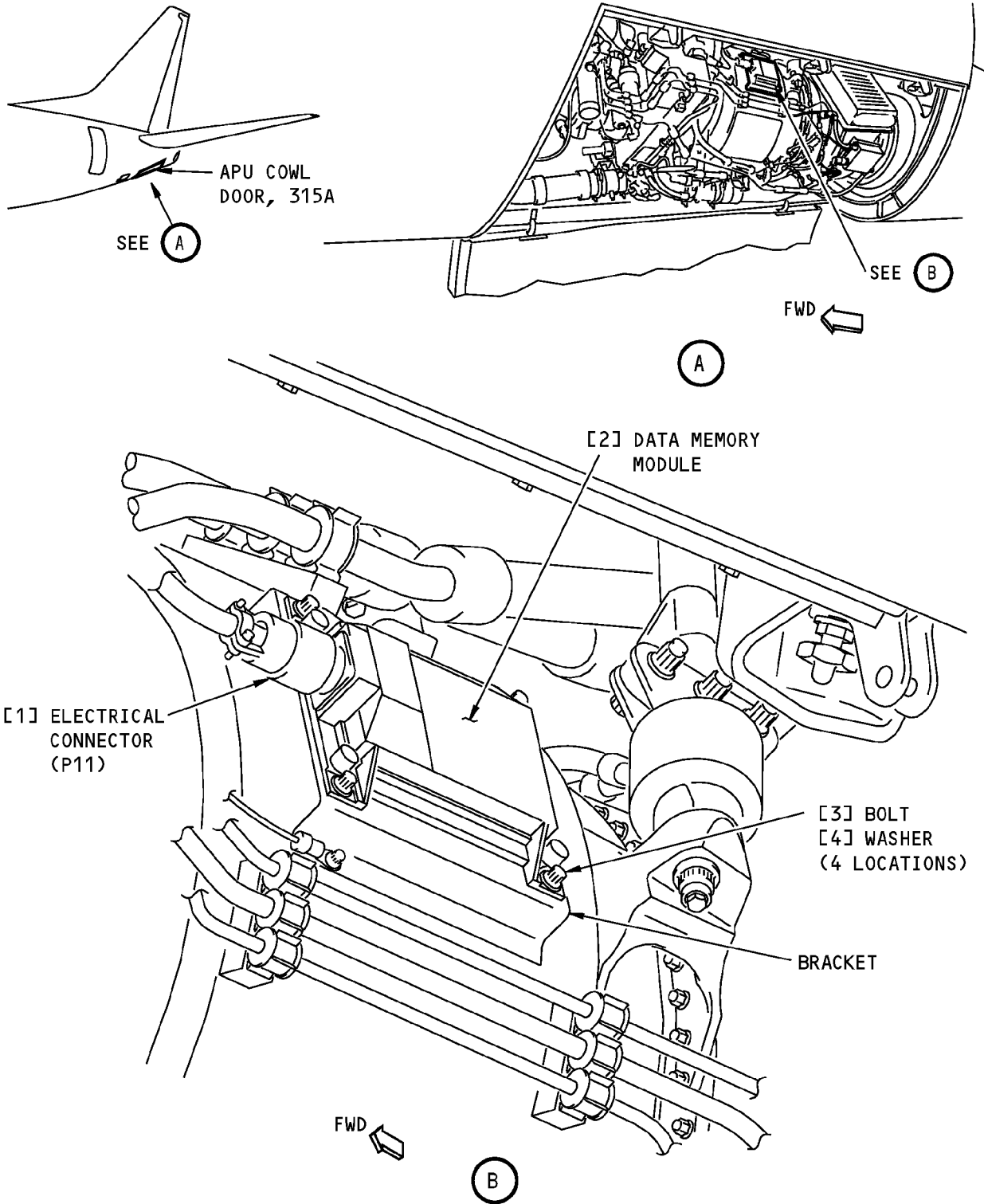
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**Data Memory Module Installation**  
**Figure 401/49-72-11-990-801**

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#### TASK 49-72-11-400-801

### 3. Data Memory Module Installation

(Figure 401)

#### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

#### B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Data memory module	49-72-11-01-005	HAP 001-013, 015-026, 028-030
		49-72-11-02-005	HAP 031-054, 101-999

#### C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

#### D. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### E. Procedure

SUBTASK 49-72-11-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

**CAUTION:** YOU MUST USE A BLANK DATA MEMORY MODULE. DO NOT USE A DATA MEMORY MODULE FROM A DIFFERENT APU OR A DATA MEMORY MODULE WITH APU DATA. IF YOU DO NOT USE A BLANK DATA MEMORY MODULE, LOSS OF DATA OR INCORRECT DATA CAN OCCUR.

- (1) Do these steps to install the data memory module [2]:
  - (a) Install the data memory module [2] on the bracket with the four washers [4] and four bolts [3].
    - 1) Tighten the four bolts [3] to 50 pound-inches (5.7 newton-meters).
  - (b) Connect the electrical connector (P11) [1] to the data memory module [2].

#### F. Data Memory Module Installation Test

SUBTASK 49-72-11-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-72-11-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-72-11-740-001

- (3) Do the installation test for the data memory module [2]:
  - (a) Set the APU master switch on the P5 forward overhead panel to the ON position.
 

NOTE: It is not necessary to start the APU to load the APU data to the blank data memory module [2].
  - (b) After 30 seconds, set the APU master switch on the P5 forward overhead panel to the OFF position.
 

NOTE: The time period to load the APU data to the blank data memory module [2] is 10 seconds.
  - (c) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (d) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
    - 1) If maintenance message(s) show for the APU indicating system or the data memory module, refer to the applicable Maintenance Message Index in the FIM.
  - (e) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

## G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-72-11-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

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## EXHAUST DUCT MUFFLER - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the exhaust duct muffler
- (2) An installation of the exhaust duct muffler.

#### **TASK 49-81-11-000-801**

### 2. Exhaust Duct Muffler Removal

(Figure 401)

A. References

<u>Reference</u>	<u>Title</u>
49-81-31-000-801	Aft Fairing Assembly Removal (P/B 401)

B. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door
318BR	Tailcone Access Door

D. Prepare for the Removal

SUBTASK 49-81-11-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-81-11-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-81-11-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.

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- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

SUBTASK 49-81-11-010-002

- (4) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

### E. Exhaust Duct Muffler Removal

SUBTASK 49-81-11-020-005

- (1) Do these steps to remove the exhaust duct muffler [1]:
  - (a) Disconnect the jumper [12] from the exhaust duct muffler [1]:
    - 1) Remove the screw [7] and washer [8] that attach the bracket [11] with the jumper [12] to the exhaust duct muffler [1].
    - 2) Move the bracket [11] with the jumper [12] away from the exhaust duct muffler [1].
    - 3) Install the washer [8] and screw [7] to the seal support assembly [5].
  - (b) Disconnect the drain tube [9] from the fitting [10] on the exhaust duct muffler [1].
  - (c) Remove the V-band clamp [6] from the exhaust duct muffler [1].
  - (d) Remove the lower aft fairing. To remove it, do this task: Aft Fairing Assembly Removal, TASK 49-81-31-000-801.  
NOTE: It is not necessary to remove the upper aft fairing.
  - (e) Slowly remove the exhaust duct muffler [1] from the tail cone compartment.  
NOTE: The weight of the exhaust duct muffler [1] is approximately 60 pounds (27.3 kg).
  - (f) Install the plugs on the drain tube [9] and fitting [10].
  - (g) Make sure you install all necessary protection covers.

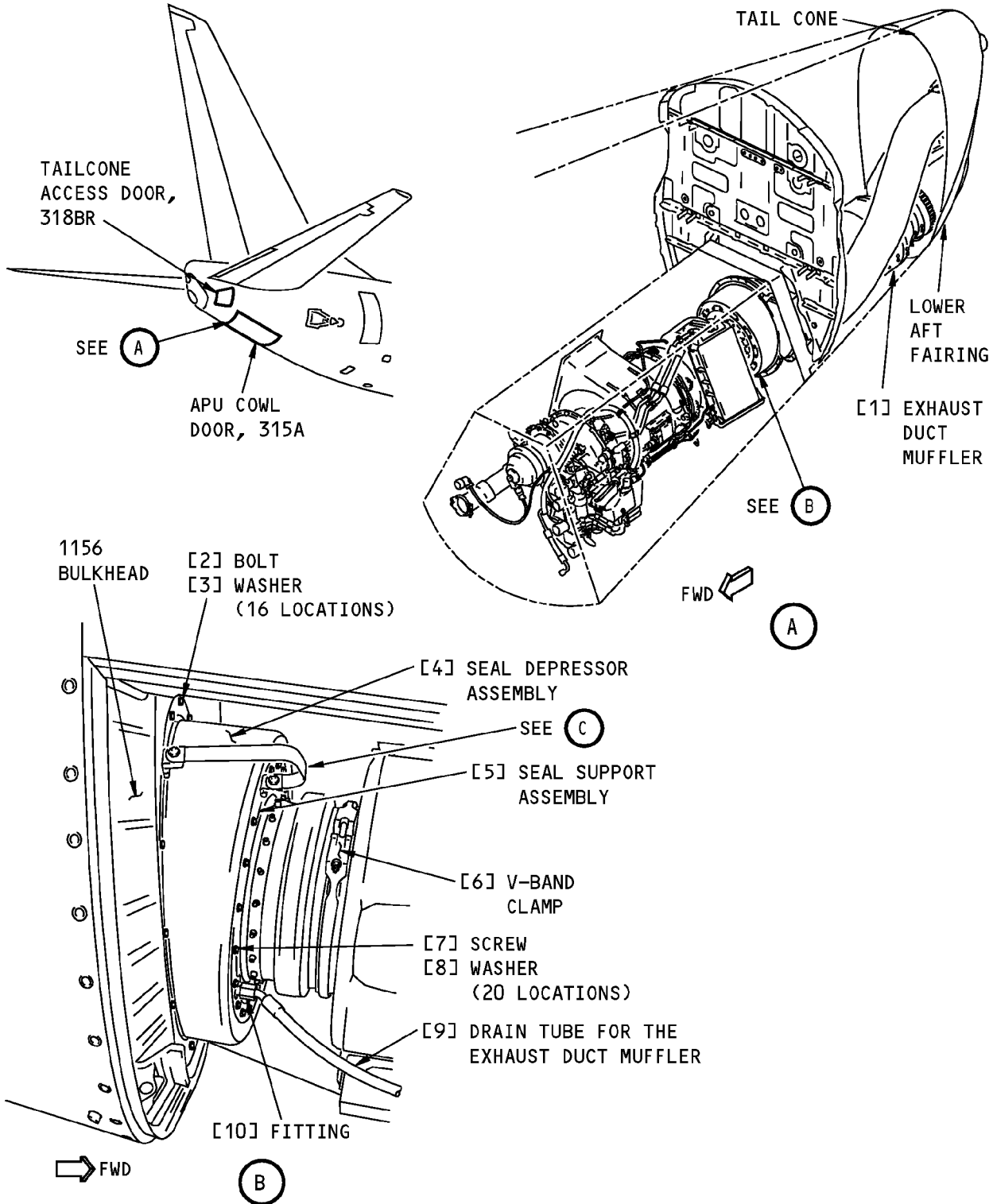
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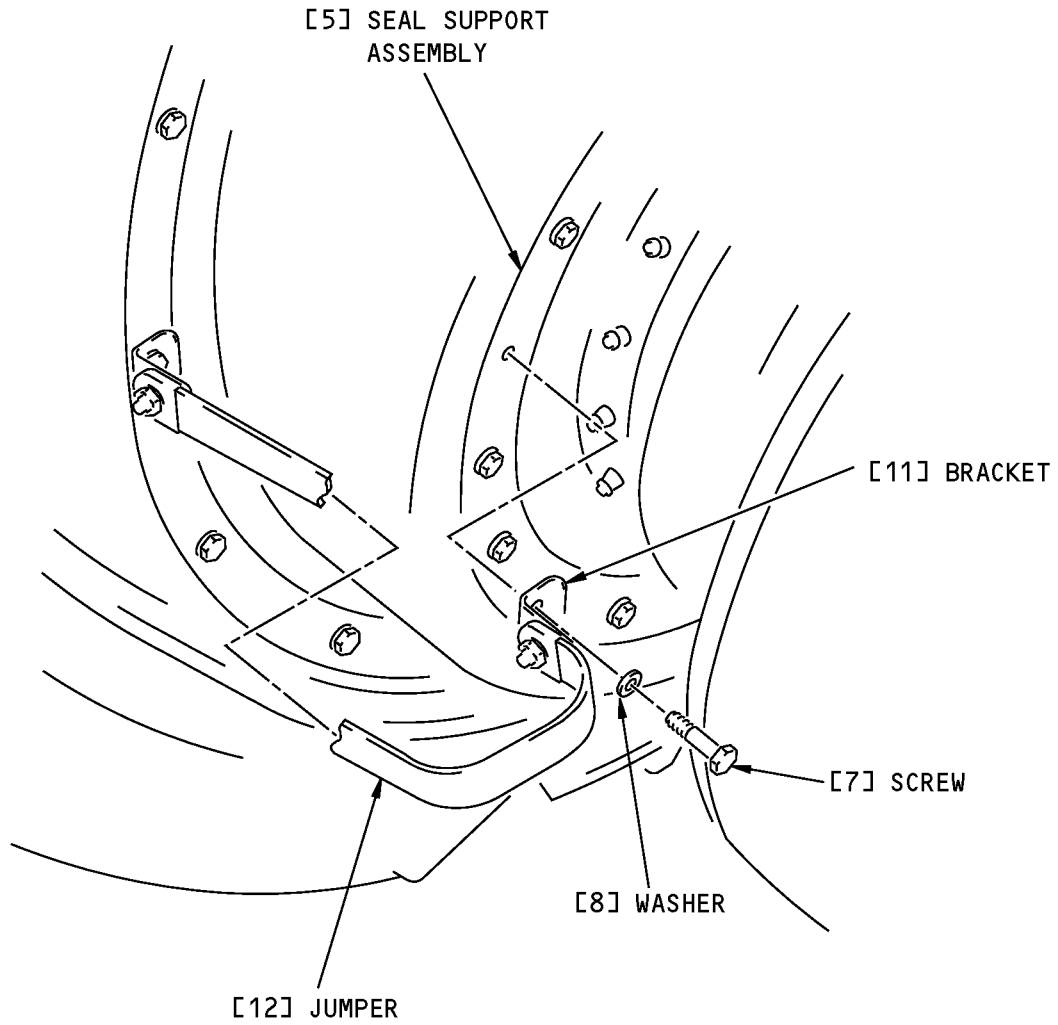


**Exhaust Duct Muffler Installation**  
**Figure 401 (Sheet 1 of 2)/49-81-11-990-802**

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(C)

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TASK 49-81-11-400-801

#### 3. Exhaust Duct Muffler Installation

(Figure 401)

##### A. References

Reference	Title
49-81-31-400-801	Aft Fairing Assembly Installation (P/B 401)

##### B. Tools/Equipment

**NOTE:** When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Meter - Bonding (Approved Explosion Proof & Intrinsically Safe) (Part #: C15292 (MODEL T477W), Supplier: 01014, A/P Effectivity: 737-ALL) (Part #: M1, Supplier: 3AD17, A/P Effectivity: 737-ALL) (Part #: M1B, Supplier: 3AD17, A/P Effectivity: 737-ALL)
STD-3906	Mallet - Rubber

##### C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F
D00173	Grease - Aircraft and Instrument, Fuel And Oxidizer Resistant	MIL-PRF-27617 (Supersedes MIL-G-27617)
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G50222	Brush - Stiff Bristle, Non-Metalic - Tampico GA55-1	

##### D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Exhaust duct muffler	49-81-00-01-050	HAP 001-013, 015-026, 028-030
		49-81-00-01A-075	HAP 031-054, 101-999

##### E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

##### F. Access Panels

Number	Name/Location
315A	APU Cowl Door
318BR	Tailcone Access Door

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### G. Procedure

SUBTASK 49-81-11-420-005

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the exhaust duct muffler [1]:
  - (a) Remove the plug from the fitting [10] on the exhaust duct muffler [1].
  - (b) Loosen the 16 bolts [2] that attach the seal depressor assembly [4] to the 1156 bulkhead.
  - (c) Loosen the 20 screws [7] that attach the seal support assembly [5] to the exhaust duct muffler [1].
  - (d) Lubricate the inner mating surfaces of the seal depressor assembly [4] with a light coat of grease, D00173.
  - (e) Carefully put the exhaust duct muffler [1] into the tail cone compartment and through the seal depressor assembly [4].

**NOTE:** The weight of the exhaust duct muffler [1] is approximately 60 pounds (27.3 kg).
  - (f) Pull or push the exhaust duct muffler [1] forward through the seal depressor assembly [4] until the exhaust duct muffler touches the APU.
  - (g) Install the lower aft fairing. To install it, do this task: Aft Fairing Assembly Installation, TASK 49-81-31-400-801.
  - (h) Make sure the exhaust duct muffler [1] touches the APU.
  - (i) Put the V-band clamp [6] on the exhaust duct muffler [1].
  - (j) Tighten the V-band clamp [6] to 70-90 pound-inches (7.9-10.2 newton-meters).
  - (k) Lightly hit the edge of the V-band clamp [6] with a rubber mallet, STD-3906.
  - (l) Continue to tighten and hit the V-band clamp [6] until the torque value stays constant.
  - (m) Tighten the 20 screws [7] on the seal support assembly [5].
  - (n) Tighten the 16 bolts [2] on the seal depressor assembly [4].
  - (o) Remove the plug from the drain tube [9].
  - (p) Apply a thin layer of Never-Seez NSBT-8N compound, D00006 on the threads of the fitting [10].
  - (q) Connect the drain tube [9] to the fitting [10] on the exhaust duct muffler [1].
  - (r) Connect the jumper [12] to the exhaust duct muffler [1]:
    - 1) Remove the screw [7] and washer [8] that attach the bracket [11] with the jumper [12] to the seal support assembly [5].
    - 2) Clean the faying surfaces of the seal support assembly [5] and the bracket [11]:
      - a) Apply alcohol, B00130 to a Tamico GA55-1 brush, G50222 or cotton wiper, G00034.
      - b) Use a small amount of pressure on the Tamico GA55-1 brush, G50222 or cotton wiper, G00034 while you clean the faying surfaces of the seal support assembly and the bracket.
      - c) Continue to clean the surfaces until there are no visible residue on the surfaces.
    - 3) Connect the bracket [11] with the jumper [12] to the seal support assembly [5] with the washer [8] and screw [7].
    - 4) Make sure the position of the bracket [11] does not cause the jumper [12] to twist or turn.

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- 5) Use an bonding meter, COM-1550 to make sure the bonding resistance across each faying surface between the exhaust duct muffler [1] and the airplane structure is a maximum of 1.0 milliohm.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-81-11-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-81-11-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-81-11-410-001

- (3) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

SUBTASK 49-81-11-410-002

- (4) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

————— END OF TASK —————

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**EXHAUST DUCT MUFFLER - INSPECTION/CHECK**

**1. General**

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
  - (1) Exhaust Duct Muffler General Visual Inspection
  - (2) Exhaust Duct Muffler Inspection.
    - (a) The exhaust duct muffler must be removed from the airplane to inspect the exhaust duct muffler and the three insulation blankets.

**TASK 49-81-11-200-802**

**2. Exhaust Duct Muffler General Visual Inspection**

- A. General
  - (1) This procedure is a scheduled maintenance task.
- B. Location Zones

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

C. Procedure

SUBTASK 49-81-11-210-002

- (1) Do these steps to visually inspect the exhaust duct muffler:
  - (a) Visually examine the front area and inner surfaces of the exhaust duct muffler that you can get access from the APU compartment for cracks and damage.
    - 1) If you find cracks or damage on the exhaust duct muffler, do this task: Exhaust Duct Muffler Inspection, TASK 49-81-11-200-801.

**END OF TASK**

**TASK 49-81-11-200-801**

**3. Exhaust Duct Muffler Inspection**

(Figure 601)

- A. General
  - (1) This procedure is a scheduled maintenance task.
- B. References

Reference	Title
49-16-11-100-801	Clean the APU Drains (P/B 701)
49-81-11-000-801	Exhaust Duct Muffler Removal (P/B 401)
49-81-11-400-801	Exhaust Duct Muffler Installation (P/B 401)

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C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
G00440	Lockwire - Corrosion Resistant Steel (0.041 inch Dia.)	NASM20995~ C41

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Exhaust duct muffler	49-81-00-01-050	HAP 001-013, 015-026, 028-030
3	Collar	49-81-00-01A-075	HAP 031-054, 101-999
		49-81-11-01-080	HAP 001-013, 015-026, 028-030
4	Upper insulation blanket	49-81-11-01A-045	HAP 031-054, 101-999
		49-81-11-01-060	HAP 001-013, 015-026, 028-030
8	Lower insulation blanket	49-81-11-01A-025	HAP 031-054, 101-999
		49-81-11-01-065	HAP 001-013, 015-026, 028-030
		49-81-11-01A-030	HAP 031-054, 101-999

E. Location Zones

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

F. Procedure

SUBTASK 49-81-11-020-003

- (1) Remove the exhaust duct muffler [1]. To remove it, do this task: Exhaust Duct Muffler Removal, TASK 49-81-11-000-801.

SUBTASK 49-81-11-020-004

- (2) Do these steps to remove the upper insulation blanket [4] and lower insulation blanket [8] from the exhaust duct muffler [1]:

**NOTE:** The rear insulation blanket [7] on the aft end cap is installed permanently with rivets.

**CAUTION:** BE CAREFUL WITH THE INSULATION BLANKETS. THE BLANKETS CAN BE EASILY DAMAGED. DO NOT LET THE BLANKETS TOUCH SHARP EDGES. DAMAGE TO THE BLANKETS CAN OCCUR.

- (a) Remove the 34 lacings [13] from the upper insulation blanket [4] and lower insulation blanket [8].
- (b) Remove the upper insulation blanket [4] and lower insulation blanket [8] from the exhaust duct muffler [1].

SUBTASK 49-81-11-210-001

- (3) Do these steps to inspect the exhaust duct muffler [1]:
  - (a) Visually examine the upper insulation blanket [4], rear insulation blanket [7] and lower insulation blanket [8] for burns, holes and tears.
    - 1) If you find burns, holes or tears, replace the insulation blanket(s).

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- (b) Visually examine the external surfaces of the exhaust duct muffler [1] for cracks and missing parts.
- 1) Cracks are not permitted on these components:
    - a) Bellows assembly [11]
    - b) Forward end cap [10]
    - c) Outer liner of the exhaust duct muffler [1]
    - d) Aft liner extension [6]
    - e) Aft end cap [5].
  - 2) Make sure the 20 hi-loks [2] and 20 collars [3] are installed on the bellows assembly [11].

NOTE: The 20 hi-loks [2] and 20 collars [3] attach the bellows assembly [11], forward end cap [10] and acoustic liner [15] together.
  - 3) One or two missing rivets are permitted on the aft liner extension [6].
- (c) Visually examine the internal surfaces of the exhaust duct muffler [1] for cracks, tears, punctures and missing parts.
- 1) If it is necessary to examine the seven baffles [16] and acoustic liner [15], do these steps to get access to the seven baffles:
    - a) Remove the 20 hi-loks [2] and 20 collars [3] that attach the bellows assembly [11] and acoustic liner [15] to the exhaust duct muffler [1].
    - b) Discard the 20 hi-loks [2] and 20 collars [3].
    - c) Remove the bellows assembly [11] and acoustic liner [15].
    - d) Cracks, tears and punctures are permitted on the seven baffles [16] and the acoustic liner [15].
    - e) Put the acoustic liner [15] and bellows assembly [11] in the forward end cap [10] and exhaust duct muffler [1] and align the 20 holes.
    - f) Apply a thin coat of sealant, A00160 to the threads of the 20 new hi-loks [2].
    - g) Install the 20 hi-loks [2] to the inner surface of the exhaust duct muffler [1] and 20 new collars [3] to the outer surface.
  - 2) If the acoustic liner [15] was not removed, make sure the 20 hi-loks [2] are installed on the acoustic liner.
- (d) Visually examine the seal assembly [12] for tears, deformation or wear damage.
- (e) Visually examine the drain tube [9] for blockage of unwanted materials.
- 1) If you find blockage of unwanted materials, remove or clean the drain tube [9]. To clean it, do this task: Clean the APU Drains, TASK 49-16-11-100-801.
- (f) Visually examine the inner surfaces of the seal depressor assembly for damaged painted surfaces which include signs of paint peeling and missing paint.
- 1) Signs of paint peeling and/or missing paint are permitted on the inner surfaces of the seal depressor assembly.

SUBTASK 49-81-11-420-003

- (4) Do these steps to install the upper insulation blanket [4] and lower insulation blanket [8] on the exhaust duct muffler [1]:

NOTE: The rear insulation blanket [7] on the aft end cap [5] is installed permanently with rivets.

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- (a) Put the upper insulation blanket [4] and lower insulation blanket [8] on the exhaust duct muffler [1].
- (b) Make sure you align the 68 lacing studs [14] along the exhaust duct muffler [1].

**CAUTION:** DO NOT USE THE LACINGS TO MOVE THE ENDS OF THE INSULATION BLANKETS TOGETHER. DO NOT TIGHTEN THE LACINGS TOO MUCH. DAMAGE TO THE INSULATION BLANKETS AND THE LACING STUDS CAN OCCUR.

- (c) While one person holds the upper insulation blanket [4] and lower insulation blanket [8] together, install the 34 lacings [13] with lockwire, G00440.

**NOTE:** You can use 0.032 inch inconel or 0.040 inch inconel lockwire.

**NOTE:** You install each lacing by a minimum of one full turn around each lacing stud. Make three to six twists at the end of the lockwire and bend the twists back or under the lockwire to hold the lacing in position.

- (d) Make sure the distance between the upper insulation blanket [4] and lower insulation blanket [8] is less than 0.15 in. (3.8 mm).
- (e) Make sure the 34 lacings [13] are not broken.

SUBTASK 49-81-11-420-004

- (5) Install the exhaust duct muffler [1]. To install it, do this task: Exhaust Duct Muffler Installation, TASK 49-81-11-400-801.

————— **END OF TASK** —————

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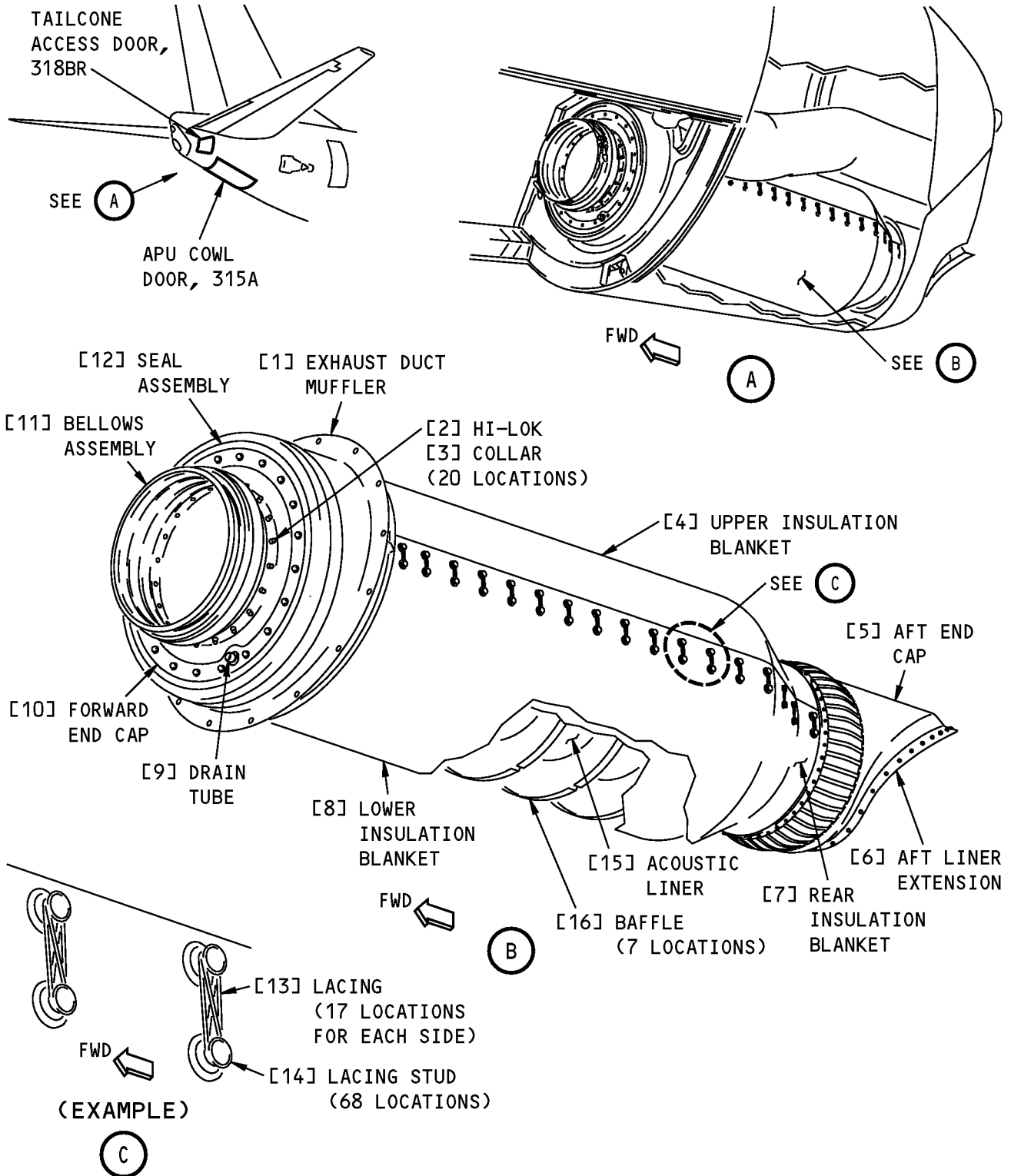
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**Exhaust Duct Muffler Inspection**  
**Figure 601/49-81-11-990-801**

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# AIRCRAFT MAINTENANCE MANUAL

## EXHAUST DUCT MUFFLER - CLEANING/PAINTING

### 1. General

- A. This procedure has the task to clean the exhaust duct muffler. To clean the exhaust duct muffler, it must be removed from the airplane.

#### **TASK 49-81-11-100-801**

### 2. Exhaust Duct Muffler Cleaning

#### A. References

Reference	Title
49-81-11-000-801	Exhaust Duct Muffler Removal (P/B 401)
49-81-11-400-801	Exhaust Duct Muffler Installation (P/B 401)

#### B. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

#### C. Consumable Materials

Reference	Description	Specification
B00012	Cleaner - Alkaline - Turco Jet Clean C	
B00541	Cleaner - General Purpose Household Detergent	
B00666	Solvent - Methyl Propyl Ketone	BMS 11-9
G00440	Lockwire - Corrosion Resistant Steel (0.041 inch Dia.)	NASM20995~ C41
G50222	Brush - Stiff Bristle, Non-Metalic - Tampico GA55-1	

#### D. Location Zones

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right

#### E. Prepare for the Cleaning

SUBTASK 49-81-11-020-001

- (1) Do this task: Exhaust Duct Muffler Removal, TASK 49-81-11-000-801.

#### F. Procedure

SUBTASK 49-81-11-020-002

- (1) Do these steps to remove the upper and lower insulation blankets from the exhaust duct muffler:

NOTE: The rear insulation blanket on the aft end cap is installed permanently with rivets.

**CAUTION:** BE CAREFUL WITH THE INSULATION BLANKETS. THE BLANKETS CAN BE EASILY DAMAGED. DO NOT LET THE BLANKETS TOUCH SHARP EDGES. DAMAGE TO THE BLANKETS CAN OCCUR.

- (a) Remove the 34 lacings from the upper insulation blanket and lower insulation blanket.
- (b) Remove the upper and lower insulation blankets from the exhaust duct muffler.

SUBTASK 49-81-11-110-001

- (2) Do these steps to clean the exhaust duct muffler:

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**CAUTION:** THE REAR INSULATION BLANKET MUST BE DRY TO FUNCTION CORRECTLY AS A FIRE-RESISTANT MATERIAL. DAMAGE TO THE REAR INSULATION BLANKET CAN OCCUR FROM FLUID CONTAMINATION.

- (a) Make sure the rear insulation blanket is dry when you clean the exhaust duct muffler.

**WARNING:** DO NOT GET THE SOLVENT IN YOUR MOUTH, OR IN YOUR EYES OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE SOLVENT. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THE SOLVENT. KEEP THE SOLVENT AWAY FROM SPARKS, FLAME AND HEAT. THE SOLVENT IS A POISONOUS AND FLAMMABLE MATERIAL WHICH CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (b) Flush the exhaust duct muffler with approximately 1 gal (3.8 l) of solvent, B00666.
- 1) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the exhaust duct muffler.

**NOTE:** It is recommended that you use a pressure of 60 psig (413.7 kPa)-90 psig (620.5 kPa) of air or nitrogen to dry the exhaust duct muffler.

- (c) Clean the exhaust duct muffler with the alkaline Turco Jet Clean C cleaner, B00012:

- 1) Apply heat and mix the alkaline solution until the temperature is 175°F (79°C).

**NOTE:** Refer to the manufacturer's mixture instructions for the alkaline solution.

- 2) Put the forward end of the exhaust duct muffler in the alkaline solution until the solution level does not touch the rear insulation blanket for approximately five minutes.
- 3) Use a Tamico GA55-1 brush, G50222 to clean all the unwanted materials off the internal areas (exhaust duct liner) of the forward and aft end of the exhaust duct muffler.
- 4) Remove the exhaust duct muffler from the alkaline solution.

- (d) Clean the exhaust duct muffler with the general purpose household detergent cleaner, B00541:

- 1) Apply heat and mix the detergent solution until the temperature is 175°F (79°C).

**NOTE:** Refer to the manufacturer's mixture instructions for the detergent solution.

- 2) Put the forward end of the exhaust duct muffler in the detergent solution until the solution level does not touch the rear insulation blanket for approximately five minutes.
- 3) Use a Tamico GA55-1 brush, G50222 to clean all the unwanted materials off the internal areas (exhaust duct liner) of the forward and aft end of the exhaust duct muffler.
- 4) Remove the exhaust duct muffler from the detergent solution.
- 5) Remove the detergent solution from the exhaust duct muffler with water.

**NOTE:** You can apply the water as a spray or use a water hose.

- 6) Drain the water from the exhaust duct muffler.

- (e) Examine the drain fitting on the exhaust duct muffler for blockage of unwanted materials.

- 1) If you find blockage of unwanted materials, remove the blockage or repair the problems that you find.

- (f) Dry the exhaust duct muffler:

- 1) Put the exhaust duct muffler in a hot air environment at 150°F (66°C) for approximately five hours.
- 2) Remove the exhaust duct muffler from the hot air environment.

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- 3) Permit the temperature of the exhaust duct muffler to decrease to 65°F (18°C)-75°F (24°C).

SUBTASK 49-81-11-420-002

- (3) Do these steps to install the upper and lower insulation blankets on the exhaust duct muffler:

**NOTE:** The rear insulation blanket on the aft end cap is installed permanently with rivets.

- (a) Put the upper and lower insulation blankets on the exhaust duct muffler.
- (b) Make sure you align the 68 lacing studs along the exhaust duct muffler.

**CAUTION:** DO NOT USE THE LACINGS TO MOVE THE ENDS OF THE INSULATION BLANKETS TOGETHER. DO NOT TIGHTEN THE LACINGS TOO MUCH. DAMAGE TO THE INSULATION BLANKETS AND THE LACING STUDS CAN OCCUR.

- (c) While one person holds the upper and lower insulation blankets together, install the 34 lacings with lockwire, G00440.

**NOTE:** You can use 0.032 inch inconel or 0.040 inch inconel lockwire.

**NOTE:** You install each lacing by a minimum of one full turn around each lacing stud. Make three to six twists at the end of the lockwire and bend the twists back or under the lockwire to hold the lacing in position.

- (d) Make sure the distance between the upper and lower insulation blankets is less than 0.15 inch (3.8 mm).
- (e) Make sure the 34 lacings are not broken.

SUBTASK 49-81-11-420-001

- (4) Do this task: Exhaust Duct Muffler Installation, TASK 49-81-11-400-801.

————— **END OF TASK** —————

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## AIRCRAFT MAINTENANCE MANUAL

### EXHAUST DUCT MUFFLER DRAIN FITTING - CLEANING/PAINTING

#### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has the task to clean the drain fitting for the exhaust duct muffler. The drain fitting is installed on the bottom of the exhaust duct muffler.

#### **TASK 49-81-12-100-801**

#### 2. Exhaust Duct Muffler Drain Fitting Cleaning

(Figure 701)

##### A. General

- (1) This procedure is a scheduled maintenance task.

##### B. References

Reference	Title
49-81-11-000-801	Exhaust Duct Muffler Removal (P/B 401)
49-81-11-400-801	Exhaust Duct Muffler Installation (P/B 401)

##### C. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1222	Bit - Drill, 0.062-0.065 Inch Diameter
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

##### D. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F

##### E. Location Zones

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right

##### F. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### G. Prepare for the Cleaning

SUBTASK 49-81-12-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-81-12-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-81-12-010-001

(3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### H. Procedure

SUBTASK 49-81-12-160-001

(1) Do these steps to clean the drain fitting [1] for the exhaust duct muffler:

**NOTE:** There is no operational checkout for the drain fitting on the exhaust duct muffler. You must clean the drain fitting to make sure there is no blockage of unwanted materials in the exhaust duct muffler.

- (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049 below the exhaust duct muffler.

**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Disconnect the drain tube [2] from the drain fitting [1] on the exhaust duct muffler.
- (c) Drain the water and fuel from the drain tube [2] and exhaust duct muffler into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (d) Examine the drain tube [2] and the drain fitting [1] for damaged threads and cracks.
- (e) Install a plug on the drain tube [2].
- (f) Use a 0.062-0.065 inch diameter drill bit, STD-1222 or equivalent tool to clear the drain fitting hole for blockage.
  - 1) If you find blockage of unwanted materials, remove the blockage.
  - 2) If there is too much blockage in the exhaust duct muffler, then do these steps:
    - a) Do this task: Exhaust Duct Muffler Removal, TASK 49-81-11-000-801.
    - b) If you can get access to the blockage of unwanted materials, remove the blockage or carefully flush with water from the aft end of the exhaust duct muffler.

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- c) If you remove the blockage, re-install the exhaust duct muffler. To re-install it, do this task: Exhaust Duct Muffler Installation, TASK 49-81-11-400-801.
- d) If there is no access to the blockage of unwanted materials, then replace the exhaust duct muffler.

These are the tasks:

Exhaust Duct Muffler Removal, TASK 49-81-11-000-801,

Exhaust Duct Muffler Installation, TASK 49-81-11-400-801.

- (g) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to blow the air through the drain fitting [1].

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to blow the air through the drain fitting.

- (h) Apply a thin layer of Never-Seez NSBT-8N compound, D00006 on the threads of the drain fitting [1].
- (i) Connect the drain tube [2] to the drain fitting [1] on the exhaust duct muffler.
- (j) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

#### I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-81-12-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-81-12-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-81-12-410-001

- (3) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— END OF TASK —————

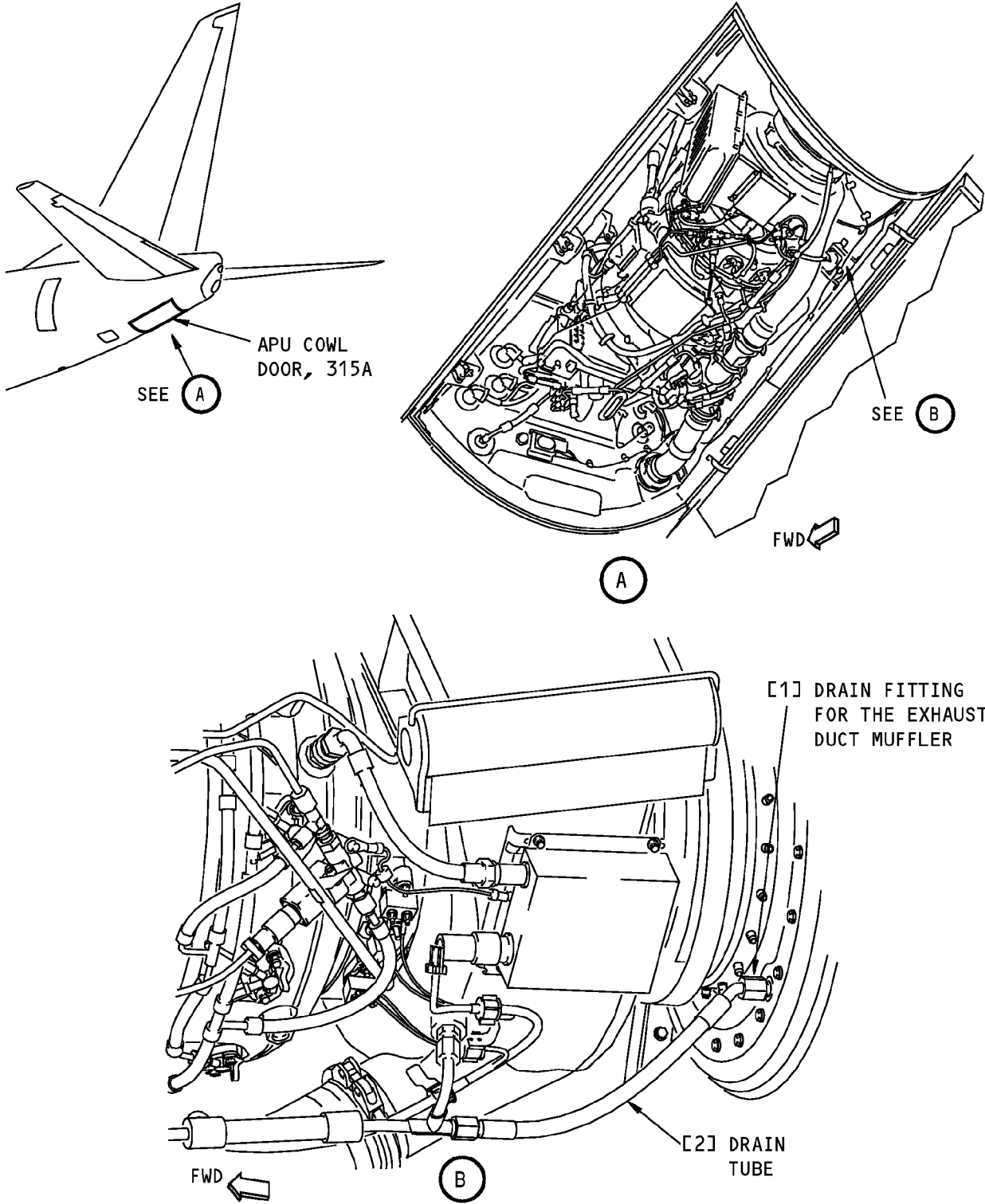
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**Exhaust Duct Muffler Drain Fitting Cleaning  
Figure 701/49-81-12-990-801**

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# AIRCRAFT MAINTENANCE MANUAL

## EXHAUST DUCT INSULATION BLANKET - INSPECTION/CHECK

### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has the task to visually inspect the exhaust duct insulation blanket.

#### **TASK 49-81-13-200-801**

### 2. Exhaust Duct Insulation Blanket General Visual Inspection

#### A. General

- (1) This procedure is a scheduled maintenance task.

#### B. References

<u>Reference</u>	<u>Title</u>
49-81-11-200-801	Exhaust Duct Muffler Inspection (P/B 601)

#### C. Location Zones

<u>Zone</u>	<u>Area</u>
318	Tail Cone Compartment - Right

#### D. Access Panels

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

#### E. Prepare for the Inspection

SUBTASK 49-81-13-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-81-13-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-81-13-010-002

- (3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

#### F. Exhaust Duct Insulation Blanket General Visual Inspection

SUBTASK 49-81-13-210-001

- (1) Do these steps to visually inspect the exhaust duct insulation blanket:
  - (a) Visually examine the exhaust duct insulation blanket for burns, holes and tears:
    - 1) If you find burns, holes or tears, do this task: Exhaust Duct Muffler Inspection, TASK 49-81-11-200-801.

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### G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-81-13-410-002

(1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

SUBTASK 49-81-13-860-003

(2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-81-13-860-004

(3) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

————— **END OF TASK** —————

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# AIRCRAFT MAINTENANCE MANUAL

## EXHAUST DUCT INSULATION BLANKET - REPAIRS

### 1. General

- A. This procedure has the task to repair temporarily the exhaust duct insulation blanket. You must inspect the repaired area(s) of the exhaust duct insulation blanket in 60 day intervals or until the exhaust duct insulation blanket is replaced. It is recommended that you replace the exhaust duct insulation blanket in six months.
- B. You must remove the exhaust duct muffler from the airplane to repair the three insulation blankets.
- C. You must do the repairs temporarily on the cold face side (external/outer) surfaces of the insulation blanket only. Damage to the insulation blanket includes punctures, tears and cracks. The repair uses dimpled foil with a metal gage of 0.003 in. (0.08 mm)-0.005 in. (0.13 mm) thick stainless steel, the dimpled foil is cut to a patch and the sealant attaches the stainless steel patch to the insulation blanket.

### **TASK 49-81-13-300-801**

### 2. Exhaust Duct Insulation Blanket Repair

(Figure 801)

#### A. References

Reference	Title
49-81-11-000-801	Exhaust Duct Muffler Removal (P/B 401)
49-81-11-400-801	Exhaust Duct Muffler Installation (P/B 401)

#### B. Tools/Equipment

Reference	Description
STD-810	Spatula - Fillet Smoothing, Hardwood or Plastic
STD-1080	Brush - Paint

#### C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
A50096	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63 Type II
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B00666	Solvent - Methyl Propyl Ketone	BMS 11-9
C00944	Primer - Firewall - Dapco No. 1-100	BMS5-63, Type I
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00744	Cloth - Emery	

#### D. Location Zones

Zone	Area
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

#### E. Prepare for the Repair

SUBTASK 49-81-13-020-001

- (1) Remove the exhaust duct muffler [1]. To remove it, do this task: Exhaust Duct Muffler Removal, TASK 49-81-11-000-801.

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### F. Damage Limits

SUBTASK 49-81-13-800-001

- (1) If the damage to the insulation blankets [2], [3], [4] is in these damage limits, you can repair the insulation blankets:
  - (a) There is no damage to the hot face side (inner surfaces of the insulation blanket that are adjacent to the exhaust duct muffler).
  - (b) A hole in the cold face side (external/outer surfaces of the insulation blanket) is less than 1.5 in. (38.1 mm) in diameter.
  - (c) A tear or crack in the cold face side is less than 23.5 in. (0.6 m) in length (from the radial direction) and less than 6 in. (152.4 mm) in length (from the longitudinal direction).
  - (d) There is a minimum of 1 in. (25.4 mm) of no damage in all directions between the damaged area(s).
  - (e) There is a minimum of 1 in. (25.4 mm) of no damage between a lacing stud (capstan) or the edge of the insulation blanket and the damaged area(s).
  - (f) Lacing stud (capstan) damage is not permitted.
  - (g) There are no missing core insulation material and no fluid contamination in the insulation blanket.
  - (h) There is no overlap between two insulation blanket patches.

### G. Insulation Blanket Repair

SUBTASK 49-81-13-220-001

- (1) Measure the damaged area(s) of the insulation blanket.
  - (a) Make sure the damaged area(s) of the insulation blanket is in the damage limits.

SUBTASK 49-81-13-341-001

- (2) Do these steps to repair the damaged area(s) of the insulation blanket:

**WARNING:** DO NOT LET THE SHARP METAL EDGES CUT YOU. PUT ON GLOVES. INJURIES TO PERSONS CAN OCCUR.

- (a) If there are ragged and sharp edges around the damaged area of the insulation blanket, trim and remove the ragged and sharp edges and loose materials that you can find.
- (b) If there is a crack or tear in the damaged area of the insulation blanket, use a punch or blank stop hole of approximately 0.12 in. (3.0 mm)-0.16 in. (4.1 mm) in diameter at each end of the crack to prevent crack growth.
- (c) Cut a patch from a clean dimpled foil that can overlap the damaged area by 1 in. (25.4 mm) in all directions.

**NOTE:** The dimpled foil is a metal gage thickness of 0.003 in. (0.08 mm)-0.005 in. (0.13 mm) stainless steel sheet per AMS 5510. You can get the dimpled foil from Arrowhead Products (4411 Katella Avenue, Los Alamitos, CA 90720) or Exotic Metals Forming Company LLC, Aircraft Services (5411 S. 226th Street, Kent, WA 98032).

- (d) Make sure that the patch must be the same shape as the damaged area but do not bend the dimpled foil more than one time.

**NOTE:** If you bend the dimpled foil more than one time, it will weaken the strength of the material.

- (e) If it is necessary, deburr the edges of the damaged area of the insulation blanket and the patch with an emery cloth, G00744 or equivalent.

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- (f) Clean the damaged area of the insulation blanket and the patch with solvent, B00184, solvent, B00666 or solvent, B00666 and a cotton wiper, G00034 but make sure that the solvent does not touch or go through the core insulation material.
- (g) Dry the surface of the damaged area of the insulation blanket and the patch with a cotton wiper, G00034.

NOTE: You must apply the Dapco No. 1-100 primer, C00944 and sealant, A00160 in four hours after you clean the damaged area and the patch.

NOTE: There is no primer if you use the sealant, A50096.

- (h) If you use sealant, A00160, then you must use Dapco No. 1-100 primer, C00944 to prepare the damaged area of the insulation blanket and the patch as follows:
  - 1) Use a paint brush, STD-1080 to apply a thin layer of Dapco No. 1-100 primer, C00944 to the damaged area surface of the insulation blanket and the faying surface of the patch.
  - 2) Let the Dapco No. 1-100 primer, C00944 dry for one hour but not longer than two hours.

NOTE: A chalky color on the damaged area surface of the insulation blanket and the faying surface of the patch shows when the Dapco No. 1-100 primer, C00944 is dry.

- (i) Use a hardwood or plastic fillet smoothing spatula, STD-810 to apply a sufficient amount of sealant, A00160 or sealant, A50096 to fill the empty area between the core insulation material, damaged area of the insulation blanket and the faying surface of the patch.

NOTE: The maximum thickness of the sealant between the damaged area of the insulation blanket and the patch is 0.125 in. (3.2 mm).

- (j) Remove the unwanted sealant from the damaged area of the insulation blanket and the patch with a cotton wiper, G00034.
- (k) Let the sealant dry for a minimum of 48 hours at 70°F (21.1°C)-80°F (26.7°C).

NOTE: You can use a heat lamp to decrease the time for the sealant to dry. The time to dry with a heat lamp is four hours at 120°F (48.9°C).

SUBTASK 49-81-13-420-001

- (3) Install the exhaust duct muffler [1]. To install it, do this task: Exhaust Duct Muffler Installation, TASK 49-81-11-400-801.

————— END OF TASK —————

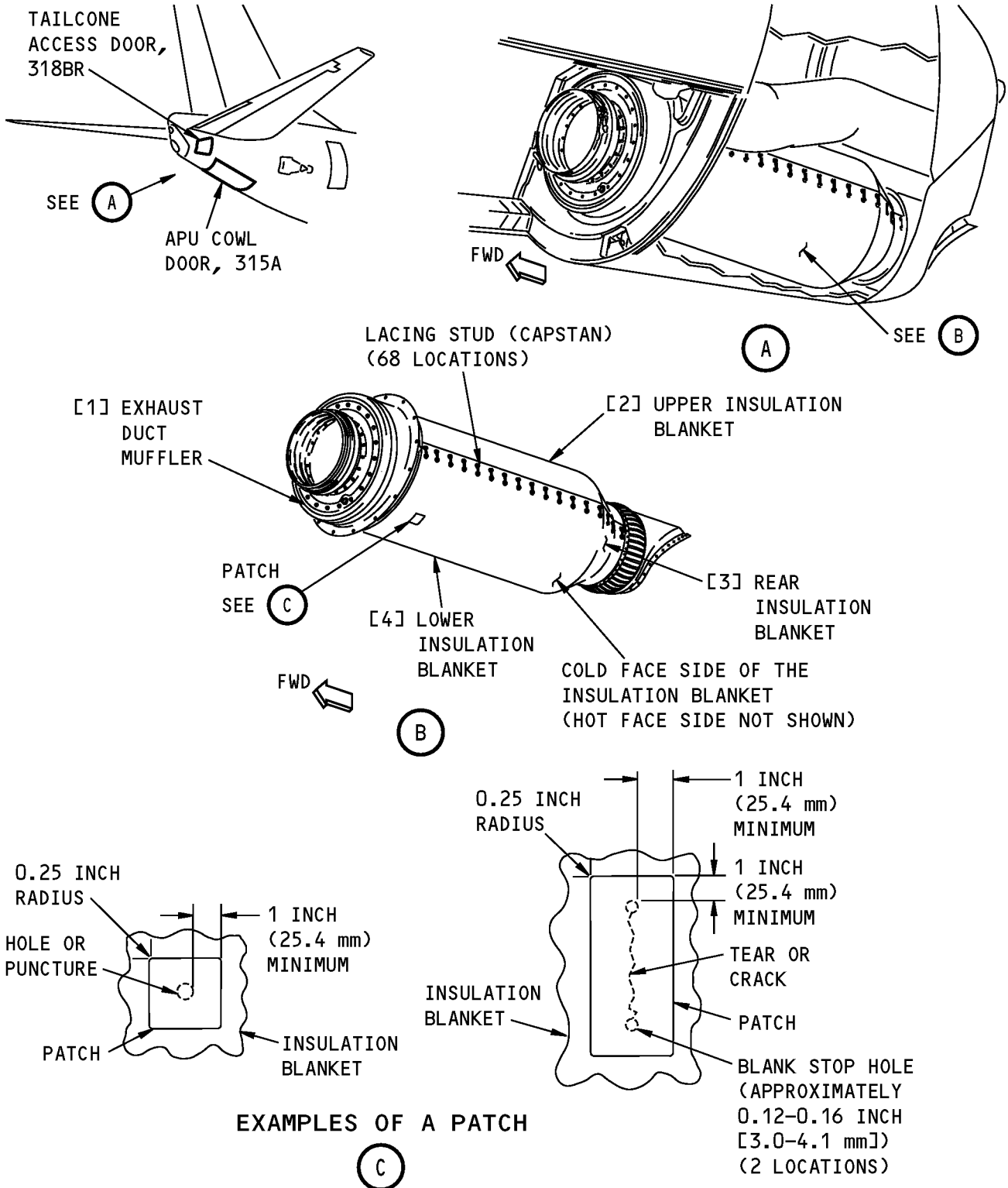
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**EXAMPLES OF A PATCH**

**Exhaust Duct Insulation Blanket Repair  
Figure 801/49-81-13-990-801**

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# AIRCRAFT MAINTENANCE MANUAL

## AFT FAIRING ASSEMBLY - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the aft fairing assembly
- (2) An installation of the aft fairing assembly.

B. The aft fairing assembly has two parts. The upper aft fairing attaches the eductor inlet duct to the tail cone. The lower aft fairing attaches the exhaust duct muffler to the tail cone. You must remove the lower aft fairing before you can remove the upper aft fairing.

### **TASK 49-81-31-000-801**

### 2. Aft Fairing Assembly Removal

(Figure 401)

A. Consumable Materials

Reference	Description	Specification
G00077	Foam - Flame Retardant Rigid Urethane	BMS8-133
G00472	Twine - Impregnated Fibrous, Lacing And Tying	MIL-T-713

B. Location Zones

Zone	Area
211	Flight Compartment - Left
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

C. Access Panels

Number	Name/Location
318BR	Tailcone Access Door

D. Prepare for the Removal

SUBTASK 49-81-31-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-81-31-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-81-31-010-001

- (3) Open this access panel:

Number	Name/Location
318BR	Tailcone Access Door

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### E. Aft Fairing Assembly Removal

SUBTASK 49-81-31-020-001

(1) Do these steps to remove the lower aft fairing [6]:

- (a) Remove the 39 screws [4] and 39 washers [5] that attach the lower aft fairing [6] to the tail cone.
- (b) Remove the nine screws [7] and nine washers [8] that attach the lower aft fairing [6] to the upper aft fairing [1].
- (c) Remove the lower aft fairing [6].
- (d) Use a twine, G00472 or equivalent to temporarily attach the exhaust duct muffler to the support structure or put a foam, G00077 pad below the aft end of the exhaust duct muffler to hold the muffler in position.

**NOTE:** Do not temporarily attach or hold the exhaust duct muffler in position if you must remove the exhaust duct muffler.

SUBTASK 49-81-31-020-002

(2) Do these steps to remove the upper aft fairing [1]:

- (a) Do the procedure in this task to remove the lower aft fairing [6].

**NOTE:** You must remove the lower aft fairing [6] before you can remove the upper aft fairing [1].

- (b) Remove the 11 screws [2] and 11 washers [3] that attach the upper aft fairing [1] to the tail cone.
- (c) Remove the upper aft fairing [1].
- (d) Use a twine, G00472 or equivalent to temporarily attach the eductor inlet duct to the support structure.

**NOTE:** Do not temporarily attach the eductor inlet duct to the support structure if you must remove the eductor inlet duct.

————— **END OF TASK** —————

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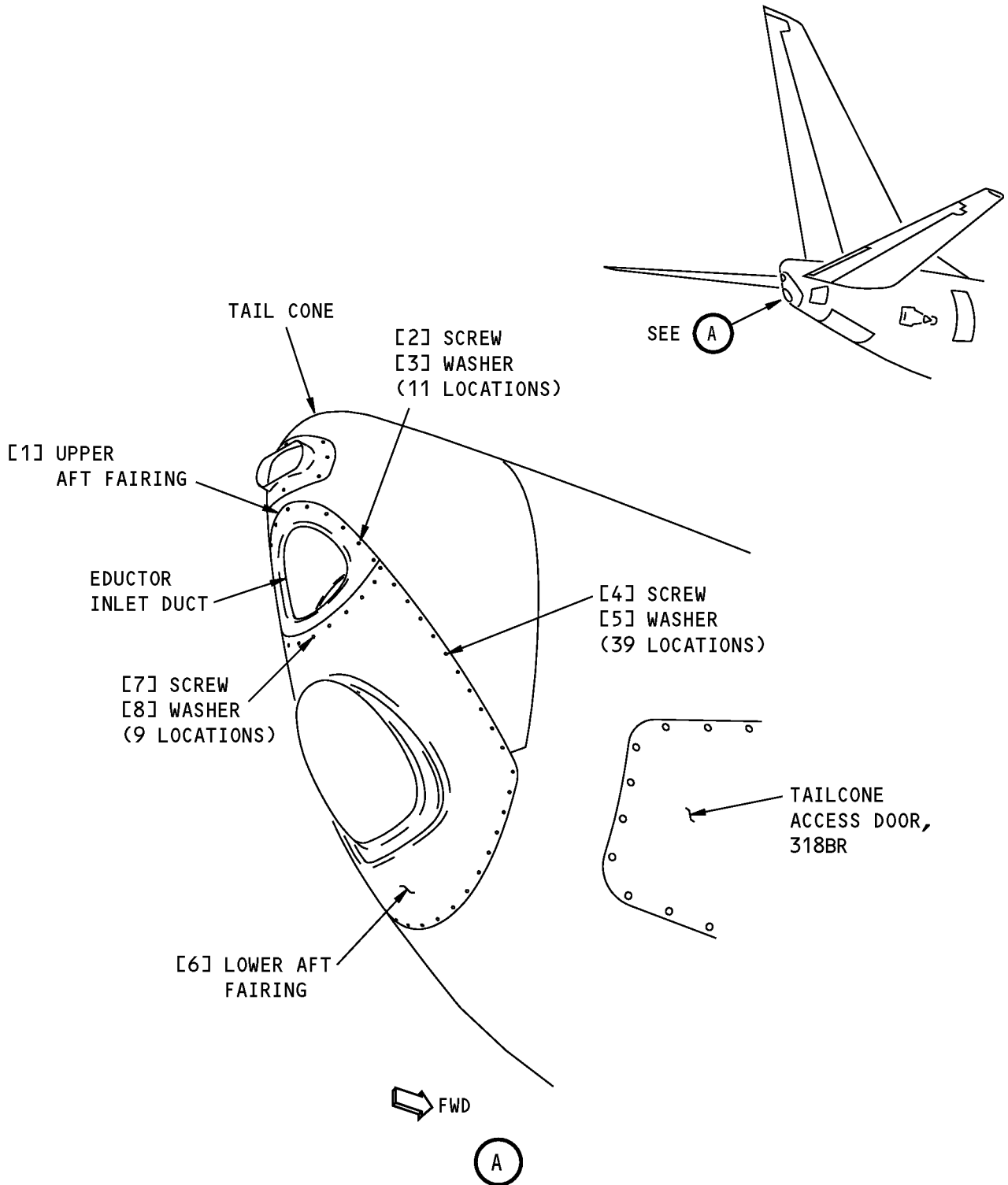
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**Aft Fairing Assembly Installation  
Figure 401/49-81-31-990-801**

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TASK 49-81-31-400-801

3. Aft Fairing Assembly Installation

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1064	Scraper - Phenolic, Hard Resin

B. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Upper aft fairing	49-81-31-01-040	HAP ALL
		53-53-00-01-495	HAP 012, 013, 015-026
6	Lower aft fairing	49-81-31-01-045	HAP ALL
		53-53-00-01-500	HAP 012, 013, 015-026
		53-53-00-20-515	HAP 028-046, 054, 101-105

D. Location Zones

Zone	Area
211	Flight Compartment - Left
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

E. Access Panels

Number	Name/Location
318BR	Tailcone Access Door

F. Procedure

SUBTASK 49-81-31-420-001

(1) Do these steps to install the upper aft fairing [1]:

- (a) Remove the temporary materials (cord or equivalent), if installed, from the eductor inlet duct.
- (b) Put the eductor inlet duct in the upper aft fairing [1].
- (c) Install the upper aft fairing [1] to the tail cone with the 11 washers [3] and 11 screws [2].

SUBTASK 49-81-31-420-002

(2) Do these steps to install the lower aft fairing [6]:

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(a) Do the procedure in this task to install the upper aft fairing [1].

NOTE: You must install the upper aft fairing [1] before you can install the lower aft fairing [6].

(b) Do these steps to clean the surfaces of the lower aft fairing [6]:

- 1) Remove the remaining sealant from the surfaces of the lower aft fairing [6] with a hard resin phenolic scraper, STD-1064 or an equivalent tool.
2) Clean the surfaces of the lower aft fairing [6] with alcohol, B00130 and a cotton wiper, G00034.
3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surfaces of the lower aft fairing [6].

NOTE: It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surfaces of the lower aft fairing [6].

(c) Remove the temporary materials (cord, foam pad or equivalent), if installed, from the exhaust duct muffler.

(d) Put the exhaust duct muffler in the lower aft fairing [6].

(e) Install the lower aft fairing [6] to the tail cone with the 39 washers [5] and 39 screws [4].

NOTE: The screws for the lower aft fairing [6] must be tightened in the correct sequence. The correct sequence is to start at the bottom screw location, then the left adjacent side and then the right adjacent side until all the screws are tightened at the top of the lower aft fairing [6].

(f) Install the lower aft fairing [6] to the upper aft fairing [1] with the nine washers [8] and nine screws [7].

(g) Apply the sealant, A00247 around the edge surfaces of the lower aft fairing [6].

(h) Remove the unwanted sealant from the lower aft fairing [6] with a cotton wiper, G00034.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-81-31-410-002

(1) Close this access panel:

Table with 2 columns: Number, Name/Location. Row 1: 318BR, Tailcone Access Door

SUBTASK 49-81-31-860-003

(2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Table with 4 columns: Row, Col, Number, Name. Row 1: B, 19, C01344, APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Table with 4 columns: Row, Col, Number, Name. Row 1: A, 14, C00033, AUX POWER UNIT CONT

SUBTASK 49-81-31-860-004

(3) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

END OF TASK

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# AIRCRAFT MAINTENANCE MANUAL

## EDUCTOR HOUSING - INSPECTION/CHECK

### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has the task to do an inspection of the eductor housing. The eductor housing is installed on the aft end of the power section assembly and forward of the turbine exhaust port.

#### **TASK 49-81-41-200-801**

### 2. Eductor Housing Inspection

(Figure 601)

#### A. General

- (1) This procedure is a scheduled maintenance task.

#### B. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

#### C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

#### D. Location Zones

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right

#### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### F. Prepare for the Inspection

SUBTASK 49-81-41-010-001

- (1) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

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### G. Procedure

SUBTASK 49-81-41-210-001

(1) Do these steps to inspect the eductor housing [1]:

(a) Visually examine the eductor housing [1] for missing and damaged bolts and nuts.

NOTE: You examine all of the sides of the eductor housing [1] that you can get access from the APU compartment.

1) If you find missing or damaged bolts and nuts, install the missing parts or replace the damaged parts.

(b) Visually examine the eductor housing [1] for cracks and surface contamination.

1) No cracks are permitted. Replace the eductor housing [1] if you find cracks on the eductor housing.

NOTE: You replace the eductor housing with the APU removed from the airplane.

2) If you find external surface contamination, clean the eductor housing:

a) Clean the surfaces of the eductor housing with alcohol, B00130 and a cotton wiper, G00034.

b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surfaces of the eductor housing.

NOTE: It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surfaces of the eductor housing.

### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-81-41-410-001

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

(a) Remove the two retainer pins from the two hold-open rods in the APU compartment.

(b) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.

(c) Install the retainer pin in the rod end of the forward hold-open rod.

(d) Install the retainer pin to the spring clip on the aft hold-open rod.

(e) Close the APU Cowl Door, 315A.

(f) Disconnect the two hold-open rods from the two brackets.

(g) Close the three latches.

————— **END OF TASK** —————

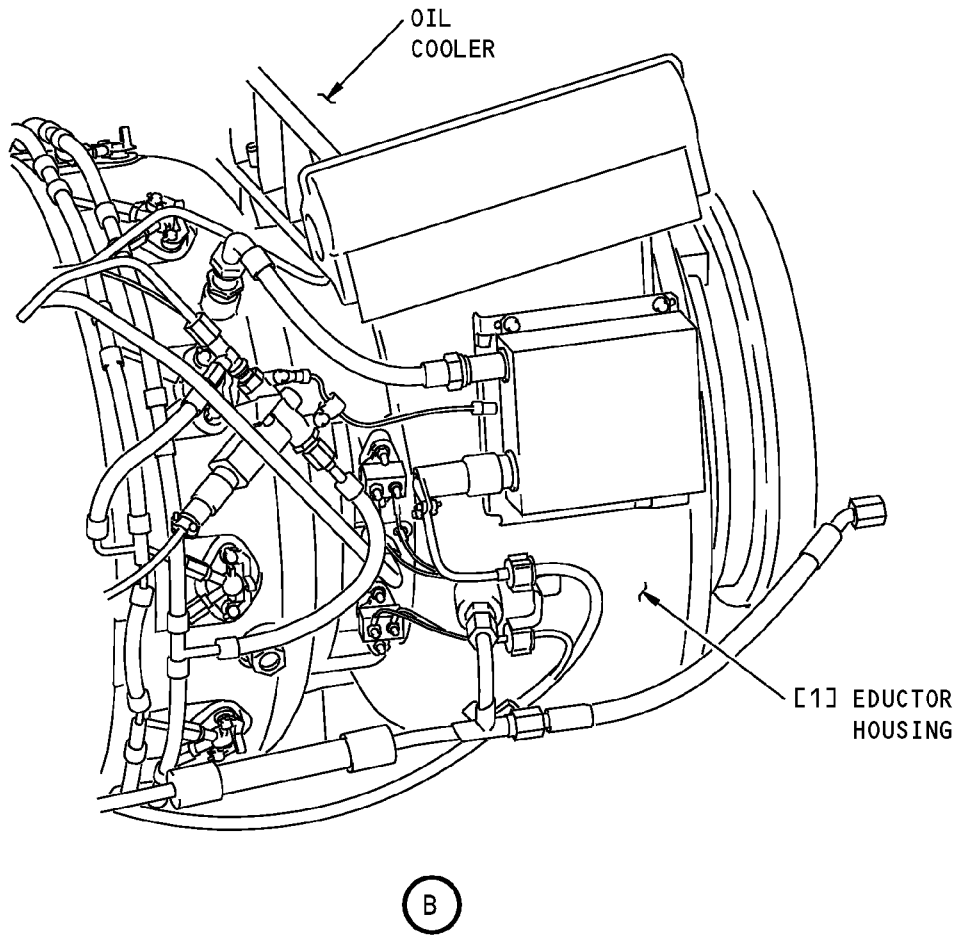
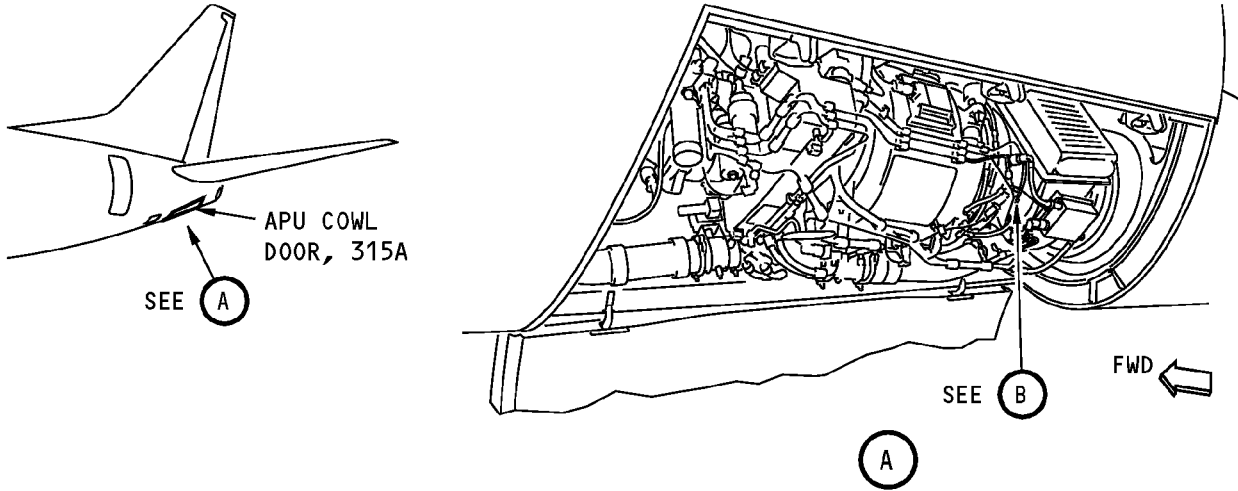
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**Eductor Housing Inspection  
Figure 601/49-81-41-990-801**

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**AIRCRAFT MAINTENANCE MANUAL**

**LUBE MODULE - REMOVAL/INSTALLATION**

**1. General**

A. This procedure has these tasks:

- (1) A removal of the lube module (fuel control unit installed on the APU)
- (2) An installation of the lube module (fuel control unit installed on the APU)
- (3) A removal of the lube module (fuel control unit removed from the APU)
- (4) An installation of the lube module (fuel control unit removed from the APU).

B. The lube module is installed on the APU gearbox.

C. There are two procedures available for the removal and installation of the lube module. Each procedure is optional to the other. You can remove the lube module with the fuel control unit installed on the APU or the fuel control unit removed from the APU.

**TASK 49-91-11-000-801**

**2. Lube Module Removal**

A. Lube Module Removal

SUBTASK 49-91-11-020-001

(1) Do one of these tasks to remove the lube module:

- (a) Do this task: Lube Module Removal (Fuel Control Unit Installed on the APU), TASK 49-91-11-000-802.
- (b) Do this task: Lube Module Removal (Fuel Control Unit Removed from the APU), TASK 49-91-11-000-803.

————— **END OF TASK** —————

**TASK 49-91-11-400-801**

**3. Lube Module Installation**

A. Lube Module Installation

SUBTASK 49-91-11-420-001

(1) Do one of these tasks to install the lube module:

- (a) Do this task: Lube Module Installation (Fuel Control Unit Installed on the APU), TASK 49-91-11-400-802.
- (b) Do this task: Lube Module Installation (Fuel Control Unit Removed from the APU), TASK 49-91-11-400-803.

————— **END OF TASK** —————

**TASK 49-91-11-000-802**

**4. Lube Module Removal (Fuel Control Unit Installed on the APU)**

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liters)

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#### B. Consumable Materials

Reference	Description	Specification
G00472	Twine - Impregnated Fibrous, Lacing And Tying	MIL-T-713

#### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Fuel control unit	49-31-11-01-040	HAP 001-013, 015-026, 028-030
16	Seal plate	49-31-11-02-035	HAP 031-054, 101-999
		49-91-11-01-009	HAP 001-013, 015-026, 028-030
		49-91-11-02-015	HAP 031-054, 101-999

#### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### F. Prepare for the Removal

SUBTASK 49-91-11-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-91-11-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-11-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.

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- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### G. Lube Module Removal

SUBTASK 49-91-11-020-002

- (1) Do these steps to disconnect the three electrical connectors [3], [8], [9]:
  - (a) Disconnect the electrical connector (P22) [3] from the fuel control unit [4].
  - (b) Disconnect the electrical connector (P15) [8] from the oil temperature sensor.
  - (c) Disconnect the electrical connector (P24) [9] from the oil filter indicator.  
**NOTE:** The oil filter indicator is also referred to as the filter bypass switch for the starter-generator.
  - (d) Install the caps on the electrical connectors to prevent contamination.

SUBTASK 49-91-11-020-003

- (2) Do these steps to disconnect the fuel control unit [4] from the lube module [7]:
  - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049 under the fuel supply tube [2].  
**WARNING:** DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.
  - (b) Disconnect the fuel supply tube [2] from the fitting [1] on the 1088 bulkhead.
  - (c) Drain the fuel from the fuel supply tube [2] into the 1 gallon (4 l) fuel resistant container, STD-4049.
  - (d) Install the plugs on the fuel supply tube [2] and fitting [1] on the 1088 bulkhead.
  - (e) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.
  - (f) Remove the coupling clamp [6] that attaches the fuel control unit [4] to the lube module [7].
  - (g) Carefully pull the fuel control unit [4] away from the lube module [7].
  - (h) Move the fuel control unit [4] to the left side and near a support structure.  
**NOTE:** The four fuel tubes will safely hold the fuel control unit [4] while you attach a twine, G00472 or equivalent to the fuel control unit and the support structure.  
**NOTE:** The engine wire harness must not be used as a support structure for the fuel control unit [4]. You can use the hinge on the oil fill cap as a support structure.
  - (i) Use a twine, G00472 or equivalent to temporarily attach the fuel control unit [4] to the support structure.
  - (j) Remove the packing [5] from the fuel control unit [4].
    - 1) Discard the packing [5].

SUBTASK 49-91-11-020-004

**WARNING:** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

- (3) Do these steps to remove the lube module [7]:
  - (a) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203 below the lube module [7].

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- (b) Release the engine wire harness from the two spring clips [10].
- (c) Open the quick-release clamp [12] on the bracket [11].
  - 1) Release the engine wire harness from the quick-release clamp [12].
- (d) Loosen the five bolts [15] that attach the lube module [7] to the APU gearbox.
- (e) Make sure that the lube module [7] does not touch the fuel control unit [4] during the lube module removal.
- (f) Carefully remove the lube module [7].

NOTE: The lube module [7] weighs approximately 9 pounds (4.1 kilograms).
- (g) Remove the packing [18] from the lube module [7].
  - 1) Discard the packing [18].
- (h) Use the 1 U.S.-gal (3.81 l) oil resistant container, STD-203 to drain the oil from the APU gearbox and lube module [7].
- (i) Remove the three bolts [13] and three washers [14] that attach the bracket [11] to the lube module [7].
- (j) Remove the bracket [11].
- (k) Make sure you install all necessary protection covers.
- (l) Remove the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

SUBTASK 49-91-11-020-005

- (4) Do these steps to remove the seal plate [16] for the lube module:

NOTE: It is necessary to replace the seal plate [16] if you find signs of oil leakage around the lube module [7].

- (a) Remove the two screws [17] that attach the seal plate [16] to the lube module [7].
- (b) Remove the seal plate [16].
  - 1) Replace the seal plate [16].

————— **END OF TASK** —————

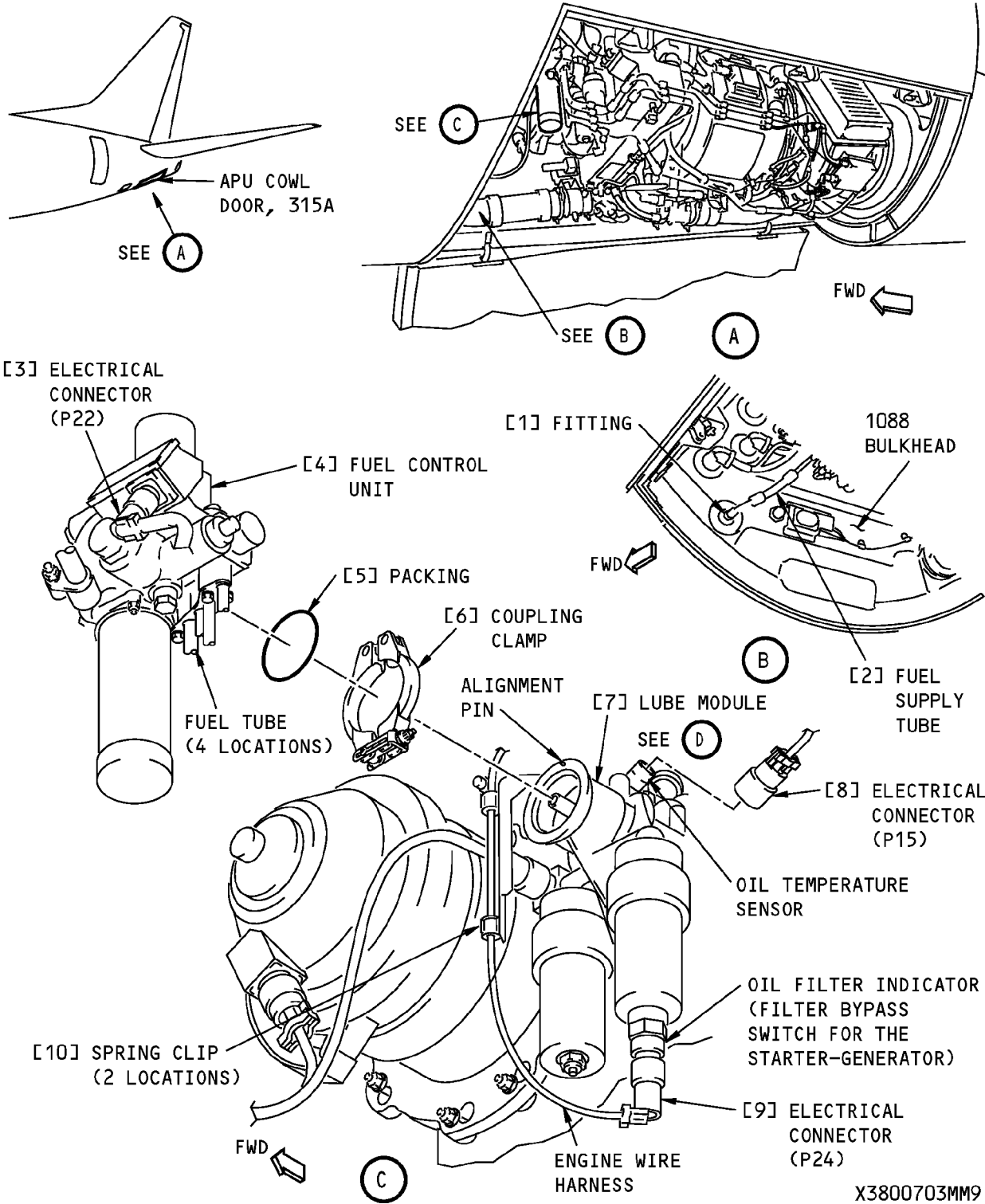
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**Lube Module Installation  
Figure 401 (Sheet 1 of 2)/49-91-11-990-801**

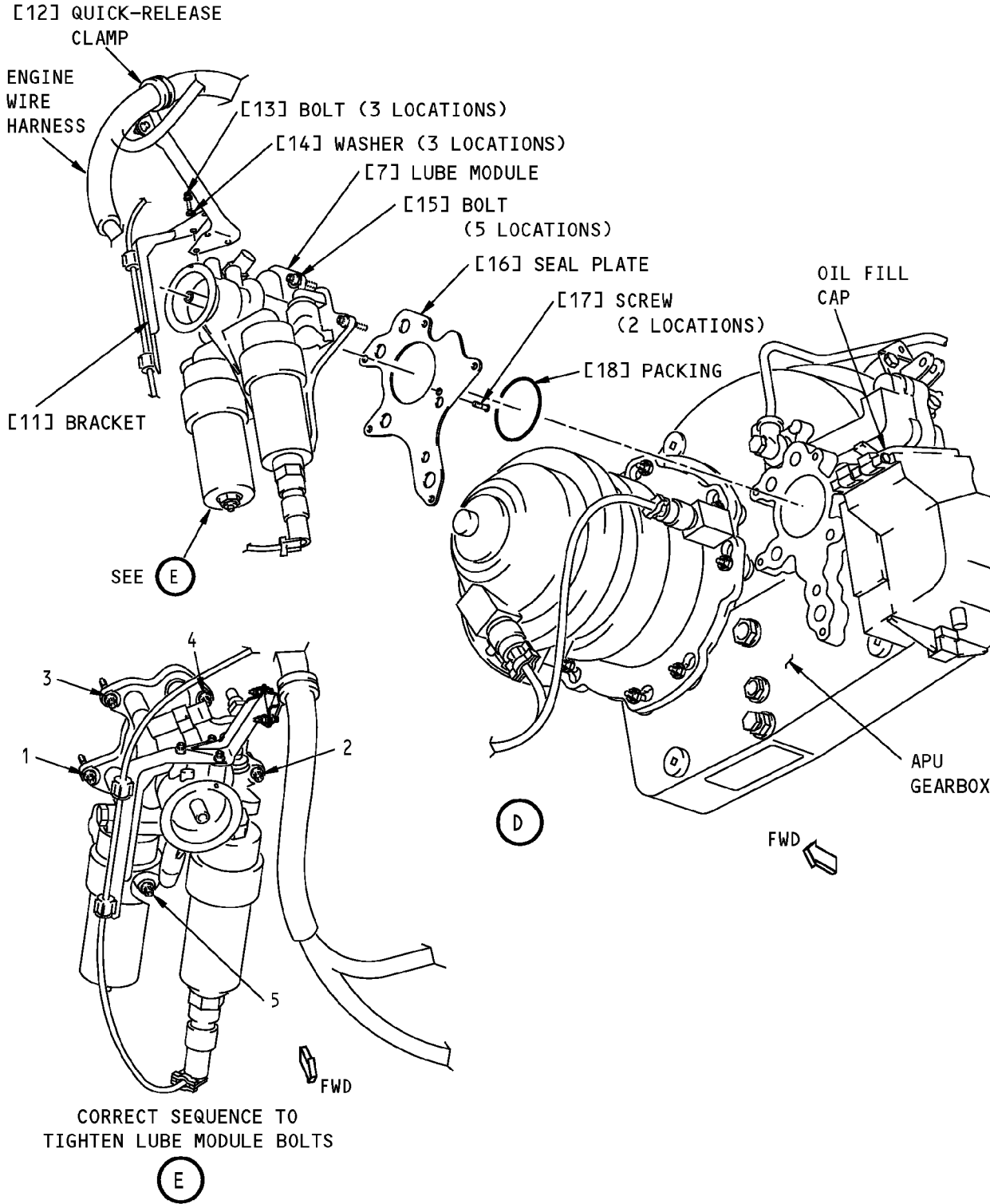
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**Lube Module Installation  
Figure 401 (Sheet 2 of 2)/49-91-11-990-801**

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TASK 49-91-11-400-802

## 5. Lube Module Installation (Fuel Control Unit Installed on the APU)

(Figure 401)

### A. References

Reference	Title
12-13-31-610-803	Fill the APU Gearbox (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

### B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236
D00633	Grease - Aircraft General Purpose	BMS3-33
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Fuel supply tube	49-31-11-01-035	HAP 001-013, 015-026, 028-030
4	Fuel control unit	49-31-11-02-030	HAP 031-054, 101-999
		49-31-11-01-040	HAP 001-013, 015-026, 028-030
5	Packing	49-31-11-02-035	HAP 031-054, 101-999
		49-31-11-01-010	HAP 001-013, 015-026, 028-030
7	Lube module	49-31-11-02-005	HAP 031-054, 101-999
		49-91-11-01-005	HAP 001-013, 015-026, 028-030
16	Seal plate	49-91-11-02-005	HAP 031-054, 101-999
		49-91-11-01-009	HAP 001-013, 015-026, 028-030
18	Packing	49-91-11-02-015	HAP 031-054, 101-999
		49-91-11-01-090	HAP 001-013, 015-026, 028-030
		49-91-11-02-120	HAP 031-054, 101-999

### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

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### F. Procedure

SUBTASK 49-91-11-420-002

- (1) If the seal plate [16] was removed from the lube module [7], install the seal plate:
  - (a) Lubricate the new seal plate [16] with a light coat of aircraft turbine engine oil, D50055.
  - (b) Install the seal plate [16] on the lube module [7] with the two screws [17].
    - 1) Tighten the two screws [17].

SUBTASK 49-91-11-420-003

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (2) Do these steps to install the lube module [7]:
  - (a) If the seal plate [16] for the lube module is not lubricated, lubricate the seal plate with a light coat of aircraft turbine engine oil, D50055.
  - (b) Install the bracket [11] on the lube module [7] with the three washers [14] and three bolts [13].
    - 1) Tighten the three bolts [13] to 50 pound-inches (5.7 newton-meters).
  - (c) Lubricate the new packing [18] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.
  - (d) Install the packing [18] in the groove of the drive spline for the lube module [7].
  - (e) Make sure that the lube module [7] does not touch the fuel control unit [4] during the lube module installation.
  - (f) Carefully install the lube module [7] in the APU gearbox.

**NOTE:** The lube module [7] weighs approximately 9 pounds (4.1 kilograms).

**CAUTION:** THE BOLTS FOR THE LUBE MODULE MUST BE TIGHTENED IN THE CORRECT SEQUENCE. SEE FIGURE 401, SHEET 2 FOR THE CORRECT SEQUENCE TO TIGHTEN THE BOLTS FOR THE LUBE MODULE. IF YOU DO NOT TIGHTEN THE BOLTS IN THE CORRECT SEQUENCE, OIL LEAKAGE CAN OCCUR.

- (g) Tighten the five bolts [15] in the sequence given to 120 pound-inches (13.6 newton-meters).
- (h) Put the engine wire harness into the quick-release clamp [12] on the bracket [11].

**NOTE:** Grommets are installed on the engine wire harness to correctly position the engine wire harness on the quick-release clamp and the two spring clips.

- 1) Close the quick-release clamp [12].
- (i) Put the engine wire harness into the two spring clips [10].

SUBTASK 49-91-11-420-004

- (3) Do these steps to connect the fuel control unit [4] to the lube module [7]:
  - (a) Lubricate the drive spline for the fuel control unit [4] with a light coat of grease, D00633.
  - (b) Lubricate the new packing [5] with a light coat of Santovac 5 lubricant, D00341 or grease, D00504.
  - (c) Install the packing [5] on the fuel control unit [4].
  - (d) Put the coupling clamp [6] on the lube module [7].
  - (e) Remove the temporary materials (cord or equivalent) that attach the fuel control unit [4] to the support structure.
  - (f) Carefully put the fuel control unit [4] in its position on the lube module [7].

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- (g) Open the coupling clamp [6] to permit the hole on the flange of the fuel control unit [4] to engage the alignment pin on the lube module flange.
- (h) Make sure the alignment pin on the lube module [7] is aligned and engages the hole on the flange of the fuel control unit [4].
- (i) Put the coupling clamp [6] over the flanges of the fuel control unit [4] and the lube module [7].
  - 1) Tighten the coupling clamp [6] to 60 pound-inches (6.8 newton-meters).
- (j) Remove the plugs from the fuel supply tube [2] and fitting [1] on the 1088 bulkhead.
- (k) Connect the fuel supply tube [2] to the fitting [1] on the 1088 bulkhead.

SUBTASK 49-91-11-420-005

(4) Do these steps to connect the three electrical connectors [3], [8], [9]:

- (a) Remove the caps from the electrical connectors.
- (b) Connect the electrical connector (P24) [9] to the oil filter indicator.

**NOTE:** The oil filter indicator is also referred to as the filter bypass switch for the starter-generator.

- (c) Connect the electrical connector (P15) [8] to the oil temperature sensor.
- (d) Connect the electrical connector (P22) [3] to the fuel control unit [4].

SUBTASK 49-91-11-610-001

(5) Do this task: Fill the APU Gearbox, TASK 12-13-31-610-803.

#### G. Lube Module Installation Test

SUBTASK 49-91-11-860-003

(1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-11-860-004

(2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-91-11-710-001

(3) Do the installation test for the lube module:

- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (b) Operate the APU for a minimum of five minutes.
- (c) During the APU operation, examine the lube module and fuel control unit for signs of oil and fuel leakage.
- (d) If you find oil or fuel leakage, do these steps to repair the leakage:
  - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
  - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.

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- 3) Repair the cause of the oil or fuel leakage.
4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
6) During the APU operation, examine the lube module and fuel control unit for signs of oil and fuel leakage.
7) If you find oil or fuel leakage, do the leakage repair again.
(e) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
1) If maintenance message(s) show for the APU oil system, APU fuel system, lube module or fuel control unit, refer to the applicable Maintenance Message Index in the FIM.
(f) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-11-410-001

- (1) To close the access panel, do these steps:

Table with 2 columns: Number, Name/Location. Row 1: 315A, APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
(b) Disconnect the two hold-open rods from the two brackets.
(c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
(d) Install the retainer pin in the rod end of the forward hold-open rod.
(e) Install the retainer pin to the spring clip on the aft hold-open rod.
(f) Close the APU Cowl Door, 315A.
(g) Close the three latches.

END OF TASK

TASK 49-91-11-000-803

6. Lube Module Removal (Fuel Control Unit Removed from the APU)

(Figure 401)

A. References

Table with 2 columns: Reference, Title. Row 1: 49-31-11-000-801, Fuel Control Unit Removal (P/B 401)

B. Tools/Equipment

Table with 2 columns: Reference, Description. Row 1: STD-203, Container - Oil Resistant, 1 U.S.-Gal (3.8 l)

C. Expendables/Parts

Table with 4 columns: AMM Item, Description, AIPC Reference, AIPC Effectivity. Row 1: 16, Seal plate, 49-91-11-01-009, HAP 001-013, 015-026, 028-030

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## D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

## E. Access Panels

Number	Name/Location
315A	APU Cowl Door

## F. Prepare for the Removal

SUBTASK 49-91-11-860-005

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-91-11-860-006

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-11-010-002

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

## G. Lube Module Removal

SUBTASK 49-91-11-020-006

- (1) Do these steps to disconnect the two electrical connectors [8], [9]:
  - (a) Disconnect the electrical connector (P15) [8] from the oil temperature sensor.
  - (b) Disconnect the electrical connector (P24) [9] from the oil filter indicator.

**NOTE:** The oil filter indicator is also referred to as the filter bypass switch for the starter-generator.

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(c) Install the caps on the electrical connectors to prevent contamination.

SUBTASK 49-91-11-020-007

(2) Do this task: Fuel Control Unit Removal, TASK 49-31-11-000-801.

SUBTASK 49-91-11-020-008

**WARNING:** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

(3) Do these steps to remove the lube module [7]:

- (a) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203 below the lube module [7].
- (b) Release the engine wire harness from the two spring clips [10].
- (c) Open the quick-release clamp [12] on the bracket [11].
  - 1) Release the engine wire harness from the quick-release clamp [12].
- (d) Loosen the five bolts [15] that attach the lube module [7] to the APU gearbox.
- (e) Carefully remove the lube module [7].

**NOTE:** The lube module [7] weighs approximately 9 pounds (4.1 kilograms).

- (f) Remove the packing [18] from the lube module [7].
  - 1) Discard the packing [18].
- (g) Use the 1 U.S.-gal (3.81 l) oil resistant container, STD-203 to drain the oil from the APU gearbox and lube module [7].
- (h) Remove the three bolts [13] and three washers [14] that attach the bracket [11] to the lube module [7].
- (i) Remove the bracket [11].
- (j) Make sure you install all necessary protection covers.
- (k) Remove the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

SUBTASK 49-91-11-020-009

(4) Do these steps to remove the seal plate [16] for the lube module:

**NOTE:** It is necessary to replace the seal plate [16] if you find signs of oil leakage around the lube module [7].

- (a) Remove the two screws [17] that attach the seal plate [16] to the lube module [7].
- (b) Remove the seal plate [16].
  - 1) Replace the seal plate [16].

————— END OF TASK —————

#### TASK 49-91-11-400-803

### 7. Lube Module Installation (Fuel Control Unit Removed from the APU)

(Figure 401)

#### A. References

Reference	Title
12-13-31-610-803	Fill the APU Gearbox (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

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(Continued)

Reference	Title
49-31-11-400-801	Fuel Control Unit Installation (P/B 401)
49-61-00-700-801	APU BITE Procedure (P/B 201)

#### B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

#### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	Lube module	49-91-11-01-005	HAP 001-013, 015-026, 028-030
		49-91-11-02-005	HAP 031-054, 101-999
16	Seal plate	49-91-11-01-009	HAP 001-013, 015-026, 028-030
		49-91-11-02-015	HAP 031-054, 101-999
18	Packing	49-91-11-01-090	HAP 001-013, 015-026, 028-030
		49-91-11-02-120	HAP 031-054, 101-999

#### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### F. Procedure

SUBTASK 49-91-11-420-006

- (1) If the seal plate [16] was removed from the lube module [7], install the seal plate:
  - (a) Lubricate the new seal plate [16] with a light coat of aircraft turbine engine oil, D50055.
  - (b) Install the seal plate [16] on the lube module [7] with the two screws [17].
    - 1) Tighten the two screws [17].

SUBTASK 49-91-11-420-007

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (2) Do these steps to install the lube module [7]:
  - (a) If the seal plate [16] for the lube module is not lubricated, lubricate the seal plate with a light coat of aircraft turbine engine oil, D50055.
  - (b) Install the bracket [11] on the lube module [7] with the three washers [14] and three bolts [13].

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- 1) Tighten the three bolts [13] to 50 pound-inches (5.7 newton-meters).
- (c) Lubricate the new packing [18] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.
- (d) Install the packing [18] in the groove of the drive spline for the lube module [7].
- (e) Install the lube module [7] in the APU gearbox.

**NOTE:** The lube module [7] weighs approximately 9 pounds (4.1 kilograms).

**CAUTION:** THE BOLTS FOR THE LUBE MODULE MUST BE TIGHTENED IN THE CORRECT SEQUENCE. SEE FIGURE 401, SHEET 2 FOR THE CORRECT SEQUENCE TO TIGHTEN THE BOLTS FOR THE LUBE MODULE. IF YOU DO NOT TIGHTEN THE BOLTS IN THE CORRECT SEQUENCE, OIL LEAKAGE CAN OCCUR.

- (f) Tighten the five bolts [15] in the sequence given to 120 pound-inches (13.6 newton-meters).
- (g) Put the engine wire harness into the quick-release clamp [12] on the bracket [11].

**NOTE:** Grommets are installed on the engine wire harness to correctly position the engine wire harness on the quick-release clamp and the two spring clips.

- 1) Close the quick-release clamp [12].
- (h) Put the engine wire harness into the two spring clips [10].

SUBTASK 49-91-11-420-008

- (3) Do this task: Fuel Control Unit Installation, TASK 49-31-11-400-801.

SUBTASK 49-91-11-420-009

- (4) Do these steps to connect the two electrical connectors [8], [9]:
  - (a) Remove the caps from the electrical connectors.
  - (b) Connect the electrical connector (P15) [8] to the oil temperature sensor.
  - (c) Connect the electrical connector (P24) [9] to the oil filter indicator.

**NOTE:** The oil filter indicator is also referred to as the filter bypass switch for the starter-generator.

SUBTASK 49-91-11-610-002

- (5) Do this task: Fill the APU Gearbox, TASK 12-13-31-610-803.

#### G. Lube Module Installation Test

SUBTASK 49-91-11-860-007

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-11-860-008

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-91-11-710-002

- (3) Do the installation test for the lube module:

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- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (b) Operate the APU for a minimum of five minutes.
- (c) During the APU operation, examine the lube module and fuel control unit for signs of oil and fuel leakage.
- (d) If you find oil or fuel leakage, do these steps to repair the leakage:
  - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
  - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
  - 3) Repair the cause of the oil or fuel leakage.
  - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
  - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - 6) During the APU operation, examine the lube module and fuel control unit for signs of oil and fuel leakage.
  - 7) If you find oil or fuel leakage, do the leakage repair again.
- (e) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
  - 1) If maintenance message(s) show for the APU oil system, APU fuel system, lube module or fuel control unit, refer to the applicable Maintenance Message Index in the FIM.
- (f) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-11-410-002

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— END OF TASK —————

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## LUBE MODULE - INSPECTION/CHECK

### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has the task to do an inspection of the lube module and the two electrical connectors.

#### **TASK 49-91-11-200-801**

### 2. Lube Module Inspection

#### A. General

- (1) This procedure is a scheduled maintenance task.

#### B. References

Reference	Title
49-91-11-000-801	Lube Module Removal (P/B 401)
49-91-11-400-801	Lube Module Installation (P/B 401)

#### C. Location Zones

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right

#### D. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### E. Prepare for the Inspection

SUBTASK 49-91-11-010-003

- (1) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

#### F. Procedure

SUBTASK 49-91-11-210-001

- (1) Do these steps to inspect the lube module and the two electrical connectors:
  - (a) Visually examine the lube module and the two electrical connectors for tightness and damage.
  - (b) Visually examine the lube module for oil leakage.

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- (c) If there are signs of oil leakage from the lube module, replace the lube module. These are the tasks:
- Lube Module Removal, TASK 49-91-11-000-801
  - Lube Module Installation, TASK 49-91-11-400-801
- (d) If there is no oil leakage, the lube module is satisfactory.

### G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-11-410-003

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— END OF TASK —————

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**AIRCRAFT MAINTENANCE MANUAL**

**OIL FILTER ELEMENTS - REMOVAL/INSTALLATION**

**1. General**

- A. This procedure has these tasks:
  - (1) A removal of the lube filter element
  - (2) An installation of the lube filter element
  - (3) A removal of the starter-generator filter element
  - (4) An installation of the starter-generator filter element.
- B. The starter-generator filter element is also referred to as the starter-generator scavenge filter element.
- C. The oil filter elements are installed on the lube module.

**TASK 49-91-12-000-801**

**2. Oil Filter Elements Removal**

A. Oil Filter Elements Removal

SUBTASK 49-91-12-020-001

- (1) Do these tasks to remove the oil filter elements:
  - (a) Do this task: Lube Filter Element Removal, TASK 49-91-12-000-802.
  - (b) Do this task: Starter-Generator Filter Element Removal, TASK 49-91-12-000-803.

————— **END OF TASK** —————

**TASK 49-91-12-400-801**

**3. Oil Filter Elements Installation**

A. Oil Filter Elements Installation

SUBTASK 49-91-12-420-001

- (1) Do these tasks to install the oil filter elements:
  - (a) Do this task: Lube Filter Element Installation, TASK 49-91-12-400-802.
  - (b) Do this task: Starter-Generator Filter Element Installation, TASK 49-91-12-400-803.

————— **END OF TASK** —————

**TASK 49-91-12-000-802**

**4. Lube Filter Element Removal**

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

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#### C. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

#### D. Prepare for the Removal

SUBTASK 49-91-12-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-91-12-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-12-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

#### E. Lube Filter Element Removal

SUBTASK 49-91-12-020-002

**WARNING:** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

**WARNING:** DO NOT LET HOT OIL GET ON YOU. PUT ON PROTECTIVE CLOTHES, GOGGLES, AND EQUIPMENT OR LET THE APU BECOME COOL. HOT OIL CAN BURN YOU.

**WARNING:** DO NOT LET THE OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

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**CAUTION:** DO NOT LET OIL GET ON THE APU OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE OIL WHEN IT FALLS ON THEM. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

- (1) Do these steps to remove the lube filter element [1]:
  - (a) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203 below the lube module.
  - (b) Remove the lube filter housing [7].
  - (c) Remove the packing [8] from the lube filter housing [7].
    - 1) Discard the packing [8].
  - (d) Remove the lube filter element [1].
    - 1) Discard the lube filter element [1].
  - (e) Make sure you install all necessary protection covers.
  - (f) Remove the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

————— **END OF TASK** —————

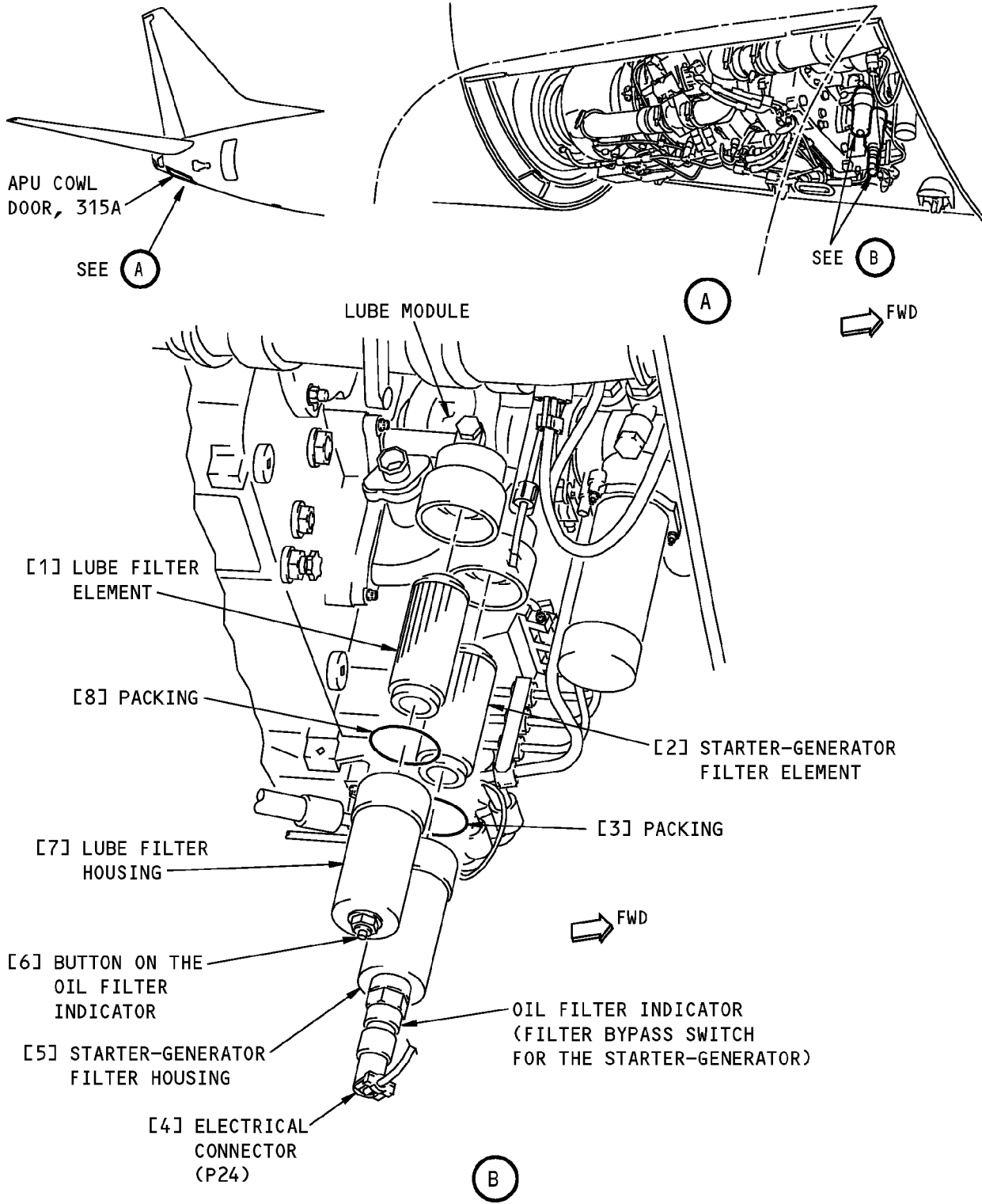
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**Oil Filter Elements Installation  
Figure 401/49-91-12-990-801**

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## TASK 49-91-12-400-802

### 5. Lube Filter Element Installation

(Figure 401)

#### A. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

#### B. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

#### C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

#### D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Lube filter element	49-91-11-01-035	HAP 001-013, 015-026, 028-030
		49-91-11-02-065	HAP 031-054, 101-999
7	Lube filter housing	49-91-11-01-010	HAP 001-013, 015-026, 028-030
		49-91-11-02-020	HAP 031-054, 101-999
8	Packing	49-91-11-01-015	HAP 001-013, 015-026, 028-030
		49-91-11-02-030	HAP 031-054, 101-999

#### E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

#### F. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### G. Procedure

SUBTASK 49-91-12-110-001

(1) Do these steps to clean the lube filter housing [7]:

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- (a) Clean the lube filter housing [7] with alcohol, B00130, and a cotton wiper, G00034.
- (b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the lube filter housing [7].

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the lube filter housing [7].

SUBTASK 49-91-12-420-002

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (2) Do these steps to install the lube filter element [1]:
  - (a) If the button [6] has extended, push the button in to put the oil filter indicator back to the serviceable condition.

**NOTE:** You must turn the lube filter housing with the opening in the down position to push in the button. A locking ball in the oil filter indicator prevents the button to be pushed in if the opening is in the up position.

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**NOTE:** There are three locations on the lube filter housing with an etched "INVERT TO RESET" marking.

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- (b) Lubricate the packing [8] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
- (c) Install the packing [8] on the lube filter housing [7].
- (d) Lubricate the packing on the new lube filter element [1] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
- (e) Install the lube filter element [1] in the lube module.
- (f) Install the lube filter housing [7] on the lube module.
  - 1) Tighten the lube filter housing [7] to 30-40 inch-pounds (3.4-4.5 newton-meters).
- (g) Make sure the APU oil system is full. To check the oil level, do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.

H. Lube Filter Element Installation Test

SUBTASK 49-91-12-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-12-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

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SUBTASK 49-91-12-790-001

- (3) Do the installation test for the lube filter element:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Operate the APU for a minimum of five minutes.
  - (c) During the APU operation, examine the lube filter housing for signs of oil leakage.
  - (d) If you find oil leakage, do these steps to repair the leakage:
    - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
    - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
    - 3) Repair the cause of the oil leakage.
    - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
    - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
    - 6) During the APU operation, examine the lube filter housing for signs of oil leakage.
    - 7) If you find oil leakage, do the leakage repair again.
  - (e) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

SUBTASK 49-91-12-640-001

- (4) Make sure the APU oil system is full. To check the oil level, do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.

## I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-12-410-001

- (1) Close this access door. To close this access door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— END OF TASK —————

### TASK 49-91-12-000-803

## 6. Starter-Generator Filter Element Removal

(Figure 401)

### A. Tools/Equipment

<u>Reference</u>	<u>Description</u>
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)

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**B. Location Zones**

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

**C. Access Panels**

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

**D. Prepare for the Removal**

SUBTASK 49-91-12-860-005

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-91-12-860-006

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-12-010-002

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

**E. Starter-Generator Filter Element Removal**

SUBTASK 49-91-12-020-003

**WARNING:** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

**WARNING:** DO NOT LET HOT OIL GET ON YOU. PUT ON PROTECTIVE CLOTHES, GOGGLES, AND EQUIPMENT OR LET THE APU BECOME COOL. HOT OIL CAN BURN YOU.

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(WARNING PRECEDES)

**WARNING:** DO NOT LET THE OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

**CAUTION:** DO NOT LET OIL GET ON THE APU OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE OIL WHEN IT FALLS ON THEM. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

- (1) Do these steps to remove the starter-generator filter element [2]:
  - (a) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203 below the lube module.
  - (b) Disconnect the electrical connector (P24) [4] from the oil filter indicator.

**NOTE:** The oil filter indicator is also referred to as the filter bypass switch for the starter-generator.

- (c) Remove the starter-generator filter housing [5].
- (d) Remove the packing [3] from the starter-generator filter housing [5].
  - 1) Discard the packing [3].
- (e) Remove the starter-generator filter element [2].
  - 1) Discard the starter-generator filter element [2].
- (f) Make sure you install all necessary protection covers.
- (g) Remove the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

————— **END OF TASK** —————

## TASK 49-91-12-400-803

### 7. Starter-Generator Filter Element Installation

(Figure 401)

#### A. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

#### B. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

#### C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

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D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Filter element	49-91-11-01-035	HAP 001-013, 015-026, 028-030
3	Packing	49-91-11-02-065	HAP 031-054, 101-999
		49-91-11-01-015	HAP 001-013, 015-026, 028-030
5	Filter housing	49-91-11-02-030	HAP 031-054, 101-999
		49-91-11-01-010	HAP 001-013, 015-026, 028-030
		49-91-11-01-013	HAP 001-013, 015-026, 028-030
		49-91-11-02-025	HAP 031-054, 101-999

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Procedure

SUBTASK 49-91-12-110-002

(1) Do these steps to clean the starter-generator filter housing [5]:

- (a) Clean the starter-generator filter housing [5] with alcohol, B00130 and a cotton wiper, G00034.
- (b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the starter-generator filter housing [5].

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the starter-generator filter housing [5].

SUBTASK 49-91-12-420-003

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

(2) Do these steps to install the starter-generator filter element [2]:

- (a) Lubricate the packing [3] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.
- (b) Install the packing [3] on the starter-generator filter housing [5].
- (c) Lubricate the packing on the new starter-generator filter element [2] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.
- (d) Install the starter-generator filter element [2] in the lube module.
- (e) Install the starter-generator filter housing [5] on the lube module.
  - 1) Tighten the starter-generator filter housing [5] to 30-40 pound-inches (3.4-4.5 newton-meters).

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- (f) Connect the electrical connector (P24) [4] to the oil filter indicator.

NOTE: The oil filter indicator is also referred to as the filter bypass switch for the starter-generator.

- (g) Make sure the APU oil system is full. To check the oil level, do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.

#### H. Starter-Generator Filter Element Installation Test

SUBTASK 49-91-12-860-007

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-12-860-008

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-91-12-710-001

- (3) Do the installation test for the starter-generator filter element:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Operate the APU for a minimum of five minutes.
  - (c) During the APU operation, examine the starter-generator filter housing for signs of oil leakage.
  - (d) If you find oil leakage, do these steps to repair the leakage:
    - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
    - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
    - 3) Repair the cause of the oil leakage.
    - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
    - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
    - 6) During the APU operation, examine the starter-generator filter housing for signs of oil leakage.
    - 7) If you find oil leakage, do the leakage repair again.
  - (e) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
    - 1) If maintenance message(s) show for the APU oil system or the oil filter indicator (filter bypass switch) on the starter-generator filter housing, refer to the applicable Maintenance Message Index in the FIM.
  - (f) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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SUBTASK 49-91-12-640-002

(4) Make sure the APU oil system is full. To check the oil level, do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-12-410-002

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

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## OIL FILTER INDICATOR - SERVICING

### 1. General

- A. This procedure has the task to do the servicing of the oil filter indicator on the lube filter housing. When the red button on the oil filter indicator has extended, the lube filter element is clogged. To put the oil filter indicator back to its serviceable condition, you must turn the lube filter housing with the opening in the down position and push in the red button. A locking ball in the oil filter indicator prevents the red button to be pushed in if the opening is in the up position.

### **HAP ALL POST AEROCONTROLEX S; LUBE MODULE POST-AEROCONTROLEX SB 4131020-49-01**

- B. There are three locations on the lube filter housing with an etched "INVERT TO RESET" marking.

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- C. The lube filter element is clogged when the red button is extended from the surface of the oil filter indicator. If the red button is flush with or below the surface of the oil filter indicator, the lube filter element is not clogged.

### **TASK 49-91-13-600-801**

### 2. Oil Filter Indicator Servicing

#### A. References

Reference	Title
49-91-12-000-802	Lube Filter Element Removal (P/B 401)
49-91-12-400-802	Lube Filter Element Installation (P/B 401)
49-91-13-000-802	Oil Filter Indicator Removal (Lube Filter Housing) (P/B 401)
49-91-13-400-802	Oil Filter Indicator Installation (Lube Filter Housing) (P/B 401)
49-91-81-200-801	Magnetic Drain Plug Inspection (P/B 601)

#### B. Location Zones

Zone	Area
316	APU Compartment - Right

#### C. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### D. Prepare for the Servicing of the Oil Filter Indicator

SUBTASK 49-91-13-010-002

- (1) Open this access door. To open this access door, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.

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(g) Install the two retainer pins in the two rod ends.

E. Procedure

SUBTASK 49-91-13-610-001

(1) Do these steps to put the oil filter indicator back to the serviceable condition:

- (a) Make sure the button on the oil filter indicator has extended.
(b) Do this task: Magnetic Drain Plug Inspection, TASK 49-91-81-200-801.
(c) Replace the lube filter element. These are the tasks:
• Lube Filter Element Removal, TASK 49-91-12-000-802,
• Lube Filter Element Installation, TASK 49-91-12-400-802.

NOTE: When you replace the lube filter element, the oil filter indicator will be put back to the serviceable condition. You must turn the lube filter housing with the opening in the down position to push in the button. A locking ball in the oil filter indicator prevents the button to be pushed in if the opening is in the up position.

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NOTE: There are three locations on the lube filter housing with an etched "INVERT TO RESET" marking.

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- (d) If the button extends again, replace the oil filter indicator on the lube filter housing. These are the tasks:
• Oil Filter Indicator Removal (Lube Filter Housing), TASK 49-91-13-000-802,
• Oil Filter Indicator Installation (Lube Filter Housing), TASK 49-91-13-400-802.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-13-410-002

(1) Close this access door. To close this access door, do these steps:

Table with 2 columns: Number, Name/Location. Row 1: 315A, APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
(b) Disconnect the two hold-open rods from the two brackets.
(c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
(d) Install the retainer pin in the rod end of the forward hold-open rod.
(e) Install the retainer pin to the spring clip on the aft hold-open rod.
(f) Close the APU Cowl Door, 315A.
(g) Close the three latches.

END OF TASK

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**OIL FILTER INDICATOR - REMOVAL/INSTALLATION**

**1. General**

A. This procedure has these tasks:

- (1) A removal of the oil filter indicator (lube filter housing)
- (2) An installation of the oil filter indicator (lube filter housing)
- (3) A removal of the oil filter indicator (starter-generator filter housing)
- (4) An installation of the oil filter indicator (starter-generator filter housing).

B. There are two oil filter indicators on the APU. One oil filter indicator is installed on the lube filter housing. The other oil filter indicator is installed on the starter-generator filter housing.

C. The oil filter indicator on the starter-generator filter housing is also referred to as the filter bypass switch for the starter-generator.

**TASK 49-91-13-000-801**

**2. Oil Filter Indicator Removal**

A. Oil Filter Indicator Removal

SUBTASK 49-91-13-020-001

- (1) Do these tasks to remove the oil filter indicator:
  - (a) Do this task: Oil Filter Indicator Removal (Lube Filter Housing), TASK 49-91-13-000-802.
  - (b) Do this task: Oil Filter Indicator Removal (Starter-Generator Filter Housing), TASK 49-91-13-000-803.

————— **END OF TASK** —————

**TASK 49-91-13-400-801**

**3. Oil Filter Indicator Installation**

A. Oil Filter Indicator Installation

SUBTASK 49-91-13-420-001

- (1) Do these tasks to install the oil filter indicator:
  - (a) Do this task: Oil Filter Indicator Installation (Lube Filter Housing), TASK 49-91-13-400-802.
  - (b) Do this task: Oil Filter Indicator Installation (Starter-Generator Filter Housing), TASK 49-91-13-400-803.

————— **END OF TASK** —————

**TASK 49-91-13-000-802**

**4. Oil Filter Indicator Removal (Lube Filter Housing)**

(Figure 401)

A. References

Reference	Title
49-91-12-000-802	Lube Filter Element Removal (P/B 401)

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B. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. Prepare for the Removal

SUBTASK 49-91-13-020-002

- (1) Do this task: Lube Filter Element Removal, TASK 49-91-12-000-802.

D. Oil Filter Indicator Removal

SUBTASK 49-91-13-020-003

**CAUTION:** DO NOT USE MAGNETIC TOOLS AROUND THE OIL FILTER INDICATOR. THERE ARE INTERNAL MAGNETS IN THE OIL FILTER INDICATOR. DAMAGE TO THE OIL FILTER INDICATOR CAN OCCUR.

- (1) Do these steps to remove the oil filter indicator [1] for the lube filter housing:
- (a) Remove the retaining ring [7] that attaches the oil filter indicator [1] to the lube filter housing.
  - (b) Remove the oil filter indicator [1].
  - (c) Remove the packing [8] from the oil filter indicator [1].
    - 1) Discard the packing [8].
  - (d) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

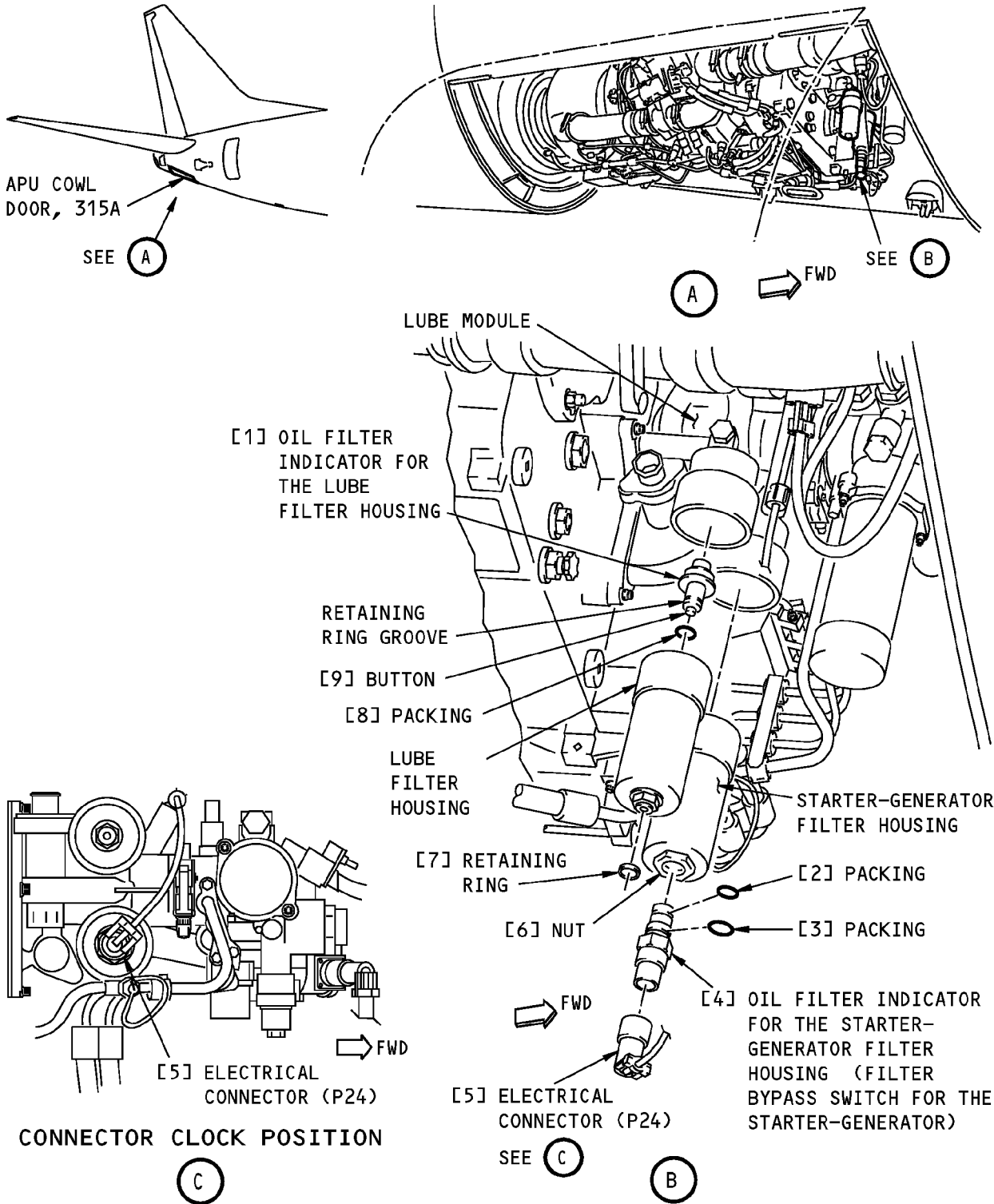
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**Oil Filter Indicator Installation**  
**Figure 401/49-91-13-990-801**

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TASK 49-91-13-400-802

5. Oil Filter Indicator Installation (Lube Filter Housing)

(Figure 401)

A. References

Reference	Title
49-91-12-400-802	Lube Filter Element Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Oil filter indicator	49-91-11-01-017	HAP 001-013, 015-026, 028-030
8	Packing	49-91-11-02-035	HAP 031-054, 101-999
		49-91-11-01-030	HAP 001-013, 015-026, 028-030
		49-91-11-02-060	HAP 031-054, 101-999

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

F. Procedure

SUBTASK 49-91-13-110-001

(1) Do these steps to clean the lube filter housing:

- (a) Clean the lube filter housing with alcohol, B00130, and a cotton wiper, G00034.
- (b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the lube filter housing.

NOTE: It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the lube filter housing.

SUBTASK 49-91-13-420-002

CAUTION: REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

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(CAUTION PRECEDES)

CAUTION: DO NOT USE MAGNETIC TOOLS AROUND THE OIL FILTER INDICATOR. THERE ARE INTERNAL MAGNETS IN THE OIL FILTER INDICATOR. DAMAGE TO THE OIL FILTER INDICATOR CAN OCCUR.

- (2) Do these steps to install the oil filter indicator [1] for the lube filter housing:
(a) Lubricate the packing [8] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
(b) Install the packing [8] on the oil filter indicator [1].
(c) Put the oil filter indicator [1] in the lube filter housing.
(d) Push the oil filter indicator [1] into the lube filter housing until the retaining ring groove shows on the outer surface of the lube filter housing.
(e) Install the retaining ring [7] on the retaining ring groove.
(f) Push the button [9] in to put the oil filter indicator [1] back to the serviceable condition.

NOTE: You must turn the lube filter housing with the opening in the down position to push in the button. A locking ball in the oil filter indicator [1] prevents the button to be pushed in if the opening is in the up position.

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NOTE: There are three locations on the lube filter housing with an etched "INVERT TO RESET" marking.

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SUBTASK 49-91-13-420-003

- (3) Do this task: Lube Filter Element Installation, TASK 49-91-12-400-802.

END OF TASK

TASK 49-91-13-000-803

6. Oil Filter Indicator Removal (Starter-Generator Filter Housing)

(Figure 401)

A. References

Table with 2 columns: Reference, Title. Row 1: 49-91-12-000-803, Starter-Generator Filter Element Removal (P/B 401)

B. Location Zones

Table with 2 columns: Zone, Area. Rows: 211 Flight Compartment - Left, 315 APU Compartment - Left, 316 APU Compartment - Right

C. Prepare for the Removal

SUBTASK 49-91-13-020-004

- (1) Do this task: Starter-Generator Filter Element Removal, TASK 49-91-12-000-803.

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## D. Oil Filter Indicator Removal

SUBTASK 49-91-13-020-005

**CAUTION:** DO NOT USE MAGNETIC TOOLS AROUND THE OIL FILTER INDICATOR. THERE ARE INTERNAL MAGNETS IN THE OIL FILTER INDICATOR. DAMAGE TO THE OIL FILTER INDICATOR CAN OCCUR.

- (1) Do these steps to remove the oil filter indicator [4] for the starter-generator filter housing:
  - (a) Hold the nut [6] on the starter-generator filter housing while you loosen the nut on the oil filter indicator [4].
    - NOTE:** The oil filter indicator [4] is also referred to as the filter bypass switch for the starter-generator.
  - (b) Remove the oil filter indicator [4].
  - (c) Remove the packing [2] and packing [3] from the oil filter indicator [4].
    - 1) Discard the packing [2] and packing [3].
  - (d) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

### TASK 49-91-13-400-803

## 7. Oil Filter Indicator Installation (Starter-Generator Filter Housing)

(Figure 401)

### A. References

Reference	Title
49-91-12-400-803	Starter-Generator Filter Element Installation (P/B 401)

### B. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

### C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G01048	Lockwire - Corrosion Resistant Steel (0.032 In. Dia.)	NASM20995~C32

### D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	49-91-11-01-022	HAP 001-013, 015-026, 028-030
		49-91-11-02-045	HAP 031-054, 101-999
3	Packing	49-91-11-01-024	HAP 001-013, 015-026, 028-030

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AMM Item	Description	AIPC Reference	AIPC Effectivity
3 (cont.)		49-91-11-02-050	HAP 031-054, 101-999
4	Oil filter indicator	49-91-11-01-021	HAP 001-013, 015-026, 028-030
		49-91-11-02-040	HAP 031-054, 101-999

### E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

### F. Procedure

SUBTASK 49-91-13-110-002

(1) Do these steps to clean the starter-generator filter housing:

- (a) Clean the starter-generator filter housing with alcohol, B00130 and a cotton wiper, G00034.
- (b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the starter-generator filter housing.

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the starter-generator filter housing.

SUBTASK 49-91-13-420-004

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

**CAUTION:** DO NOT USE MAGNETIC TOOLS AROUND THE OIL FILTER INDICATOR. THERE ARE INTERNAL MAGNETS IN THE OIL FILTER INDICATOR. DAMAGE TO THE OIL FILTER INDICATOR CAN OCCUR.

(2) Do these steps to install the oil filter indicator [4] for the starter-generator filter housing:

- (a) Lubricate the new packing [2] and new packing [3] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.
- (b) Install the packing [3] on the oil filter indicator [4].

**NOTE:** The oil filter indicator [4] is also referred to as the filter bypass switch for the starter-generator.

- (c) Install the packing [2] on the oil filter indicator [4].
- (d) Put the oil filter indicator [4] in the starter-generator filter housing.
- (e) Hold the nut [6] on the starter-generator filter housing while you tighten the nut on the oil filter indicator [4] to 110-120 pound-inches (12.4-13.5 newton-meters).
- (f) Install the lockwire, G01048 to the nut on the oil filter indicator [4].

SUBTASK 49-91-13-420-005

(3) Do this task: Starter-Generator Filter Element Installation, TASK 49-91-12-400-803.

- (a) Make sure the oil filter indicator [4] aligns with the electrical connector (P24) [5] at the 2 o'clock position.

————— **END OF TASK** —————

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## AIRCRAFT MAINTENANCE MANUAL

### OIL FILTER INDICATOR - INSPECTION/CHECK

#### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has the task to do an inspection of the oil filter indicator on the lube filter housing.

#### **TASK 49-91-13-200-801**

#### 2. Oil Filter Indicator Inspection

(Figure 601)

##### A. General

- (1) This procedure is a scheduled maintenance task.

##### B. References

Reference	Title
49-91-13-600-801	Oil Filter Indicator Servicing (P/B 301)

##### C. Location Zones

Zone	Area
316	APU Compartment - Right

##### D. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### E. Prepare for the Inspection

SUBTASK 49-91-13-010-001

- (1) Open this access door. To open this access door, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

##### F. Procedure

SUBTASK 49-91-13-210-001

- (1) Do these steps to inspect the oil filter indicator [1] on the lube filter housing [2]:
  - (a) Visually examine the red button [3] on the oil filter indicator [1].

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- (b) If the red button [3] on the oil filter indicator [1] has extended, then do this task: Oil Filter Indicator Servicing, TASK 49-91-13-600-801.

NOTE: The lube filter element is clogged when the red button is extended from the surface of the oil filter indicator. If the red button is flush with or below the surface of the oil filter indicator, the lube filter element is not clogged.

- (c) If the red button [3] on the oil filter indicator [1] has not extended, the oil filter indicator is satisfactory.

NOTE: The lube filter element is not clogged.

### G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-13-410-001

- (1) Close this access door. To close this access door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

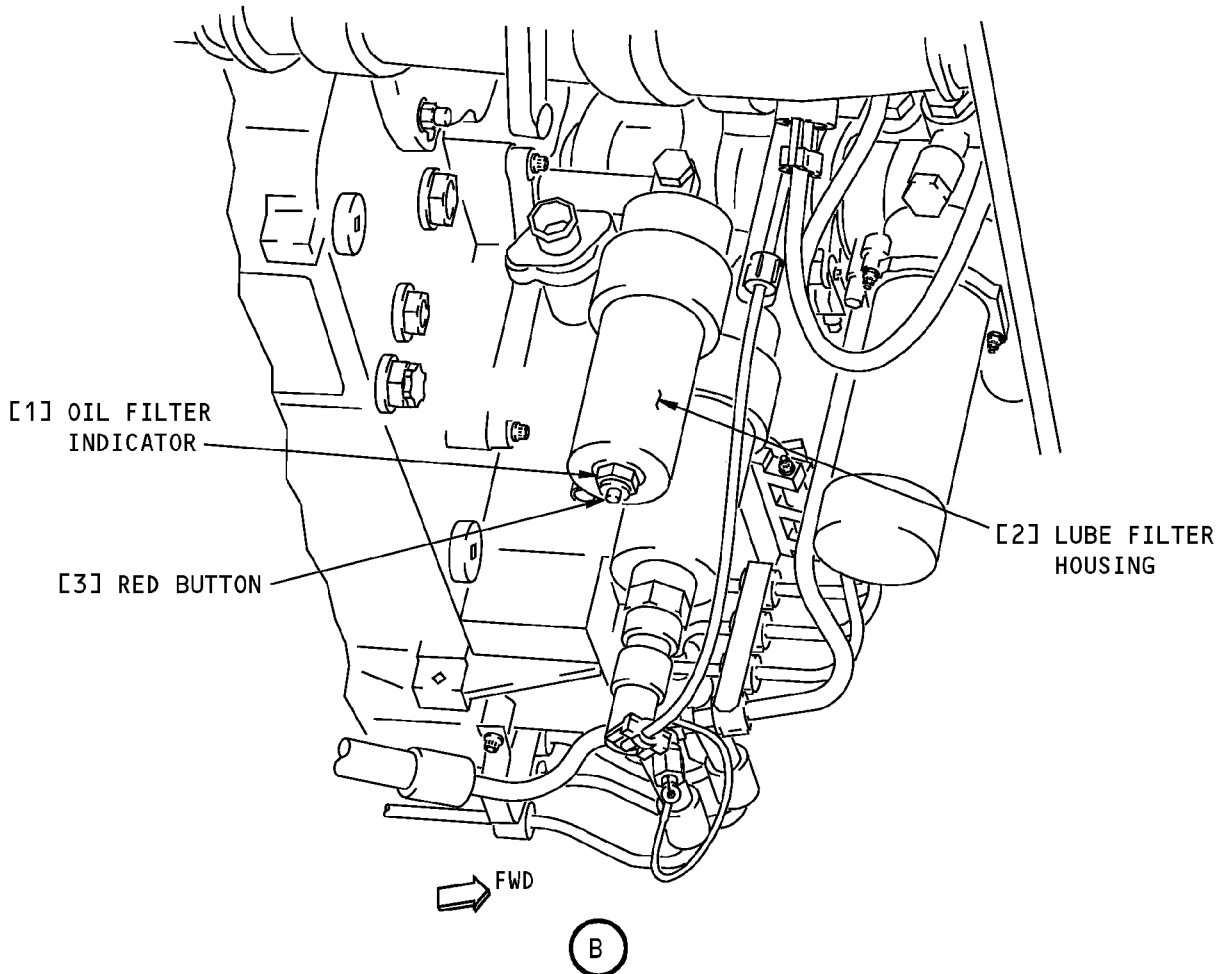
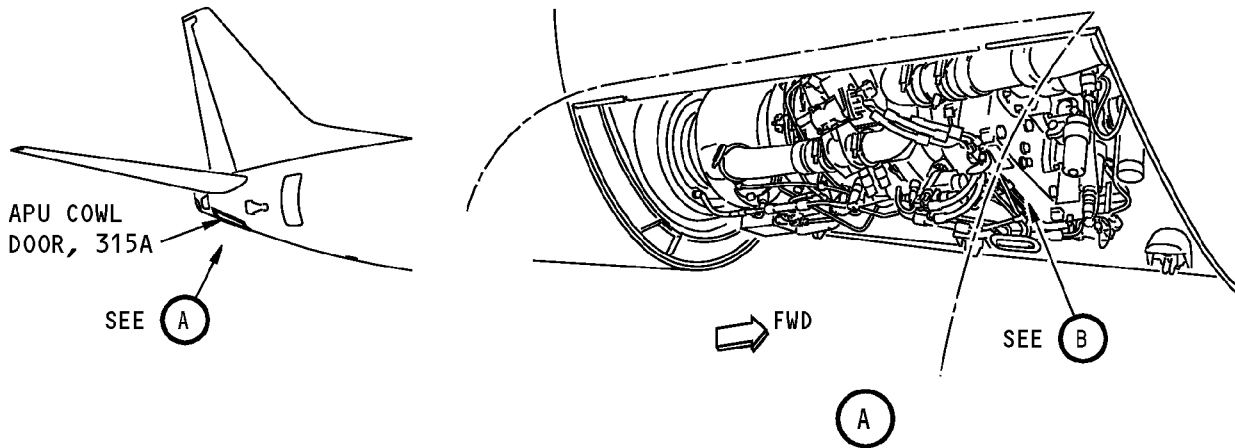
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**Oil Filter Indicator Inspection  
Figure 601/49-91-13-990-802**

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# AIRCRAFT MAINTENANCE MANUAL

## TEMPERATURE CONTROL VALVE - REMOVAL/INSTALLATION

### 1. General

A. This procedure has these tasks:

- (1) A removal of the temperature control valve
- (2) An installation of the temperature control valve.

B. The temperature control valve is installed on the APU gearbox.

#### **TASK 49-91-21-000-801**

### 2. Temperature Control Valve Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
8	Seal plate	49-91-21-01-015	HAP 001-013, 015-026, 028-030
		49-91-21-02-005	HAP 031-054, 101-999

C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Prepare for the Removal

SUBTASK 49-91-21-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-91-21-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-91-21-010-001

(3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### F. Temperature Control Valve Removal

SUBTASK 49-91-21-020-001

**WARNING:** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

- (1) Do these steps to disconnect the supply and return tubes [1], [2] for the oil cooler:
  - (a) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203 below the APU gearbox.
  - (b) Loosen the two nuts [4] that attach the supply and return tubes [1], [2] for the oil cooler to the temperature control valve [3].
  - (c) Turn the two tube retainers on the supply and return tubes [1], [2] counterclockwise until the flanges disengage from the two studs.
  - (d) Disconnect the supply and return tubes [1], [2] from the temperature control valve [3].
  - (e) Use the 1 U.S.-gal (3.81 l) oil resistant container, STD-203 to drain the oil from the supply and return tubes [1], [2].
  - (f) Remove the four packings [5] from the supply and return tubes [1], [2].
    - 1) Discard the four packings [5].

SUBTASK 49-91-21-020-002

- (2) Do these steps to remove the temperature control valve [3]:
  - (a) Loosen the two nuts [7] that attach the temperature control valve [3] to the APU gearbox.
  - (b) Turn the temperature control valve [3] clockwise until the flanges disengage from the two studs.
  - (c) Remove the temperature control valve [3].
  - (d) Use the 1 U.S.-gal (3.81 l) oil resistant container, STD-203 to drain the oil from the temperature control valve [3].
  - (e) Make sure you install all necessary protection covers.
  - (f) Remove the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

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SUBTASK 49-91-21-020-003

(3) Do these steps to remove the seal plate [8] for the temperature control valve:

NOTE: It is necessary to replace the seal plate [8] if you find signs of oil leakage around the temperature control valve [3].

- (a) Remove the two screws [6] that attach the seal plate [8] to the temperature control valve [3].
- (b) Remove the seal plate [8].
  - 1) Replace the seal plate [8] if you find damage that can cause an oil leakage.

————— **END OF TASK** —————

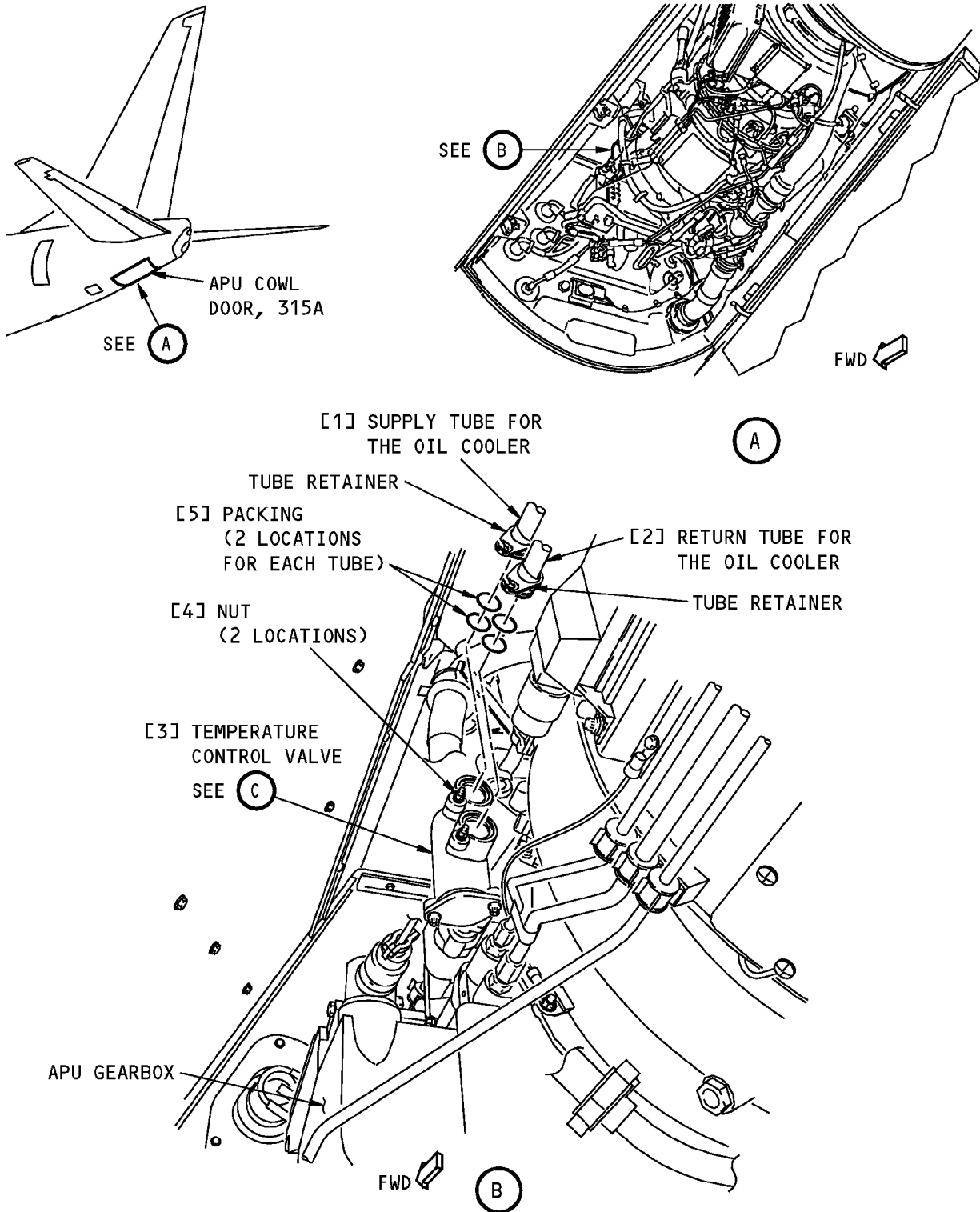
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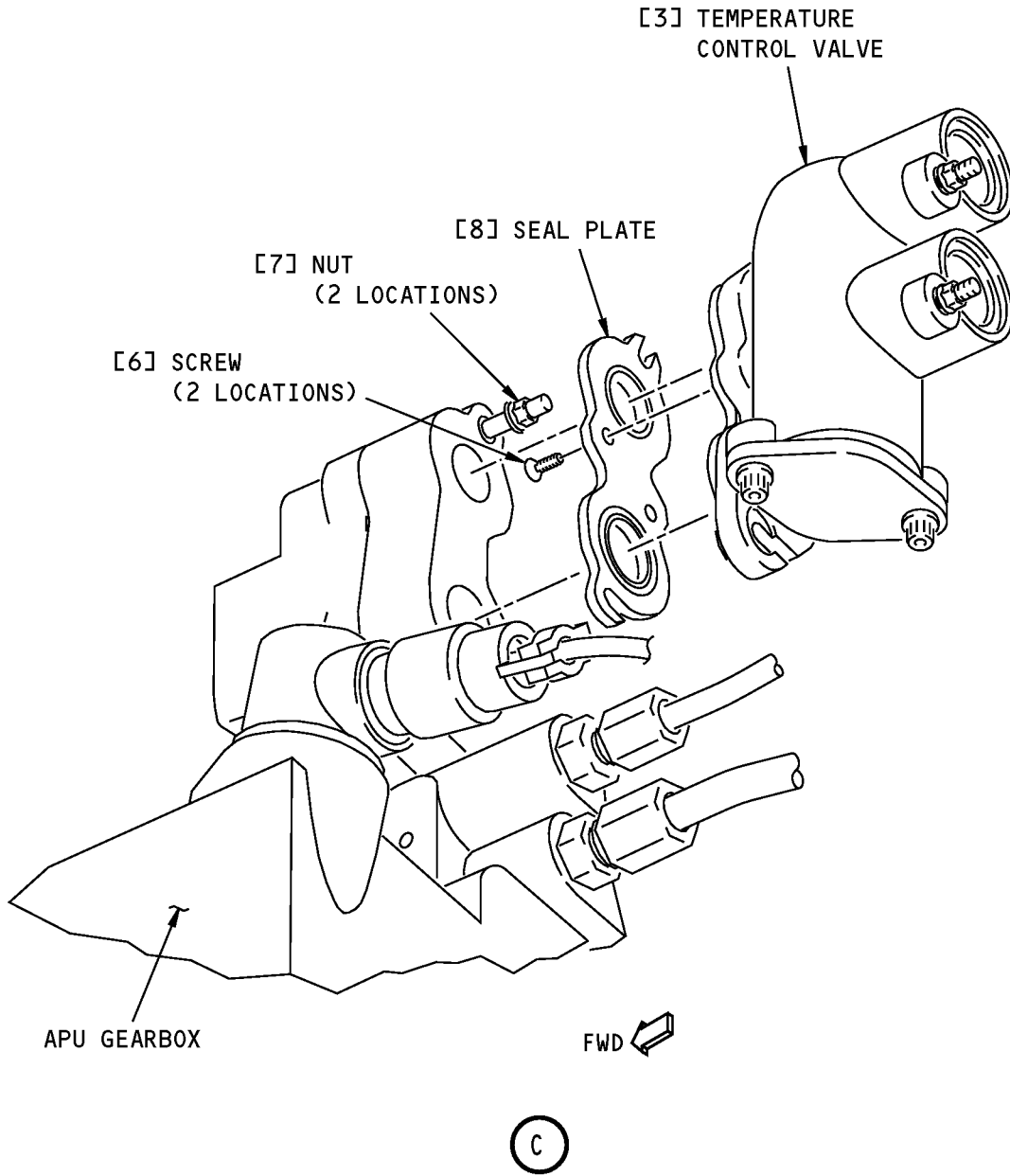
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**Temperature Control Valve Installation  
Figure 401 (Sheet 1 of 2)/49-91-21-990-801**

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**Temperature Control Valve Installation  
Figure 401 (Sheet 2 of 2)/49-91-21-990-801**

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TASK 49-91-21-400-801

#### 3. Temperature Control Valve Installation

(Figure 401)

##### A. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

##### B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

##### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Temperature control valve	49-91-21-01-055	HAP 001-013, 015-026, 028-030
5	Packing	49-91-21-02-045	HAP 031-054, 101-999
		49-91-21-01-025	HAP 001-013, 015-026, 028-030
8	Seal plate	49-91-21-02-015	HAP 031-054, 101-999
		49-91-21-01-015	HAP 001-013, 015-026, 028-030
		49-91-21-02-005	HAP 031-054, 101-999

##### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

##### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### F. Procedure

SUBTASK 49-91-21-420-001

- (1) If the seal plate [8] was removed from the temperature control valve [3], install the seal plate:
  - (a) Lubricate the new seal plate [8] with a light coat of aircraft turbine engine oil, D50055.
  - (b) Install the seal plate [8] on the temperature control valve [3] with the two screws [6].
    - 1) Tighten the two screws [6] to 30-34 pound-inches (3.4-3.8 newton-meters).

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SUBTASK 49-91-21-420-002

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (2) Do these steps to install the temperature control valve [3]:
  - (a) If the seal plate [8] is not lubricated, lubricate the seal plate with a light coat of aircraft turbine engine oil, D50055.
  - (b) Install the temperature control valve [3] on the APU gearbox.
  - (c) Make sure the top flange of the temperature control valve [3] engages the top stud.
  - (d) Turn the temperature control valve [3] counterclockwise until the bottom flange fully engages the bottom stud.
  - (e) Tighten the two nuts [7] to 40 pound-inches (4.5 newton-meters).

SUBTASK 49-91-21-420-003

- (3) Do these steps to connect the supply and return tubes [1], [2] for the oil cooler:
  - (a) Lubricate the four new packings [5] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.
  - (b) Install the four packings [5] on the supply and return tubes [1], [2].
  - (c) Connect the supply and return tubes [1], [2] to the temperature control valve [3].
  - (d) Turn the two tube retainers on the supply and return tubes [1], [2] clockwise until the flanges engage the two studs.
  - (e) Tighten the two nuts [4] to 40 pound-inches (4.5 newton-meters).

## G. Temperature Control Valve Installation Test

SUBTASK 49-91-21-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-21-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-91-21-710-001

- (3) Do the installation test for the temperature control valve:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Operate the APU for a minimum of five minutes.
  - (c) During the APU operation, examine the temperature control valve for signs of oil leakage.
  - (d) If you find oil leakage, do these steps to repair the leakage:
    - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
    - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.

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- 3) Repair the cause of the oil leakage.
- 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
- 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- 6) During the APU operation, examine the temperature control valve for signs of oil leakage.
- 7) If you find oil leakage, do the leakage repair again.
- (e) Make sure the BUS TRANS switch on the P5 forward overhead panel is in the AUTO position.
- (f) Make sure the APU GEN OFF BUS light on the P5 forward overhead panel is on.
- (g) Set the two APU GEN switches on the P5 forward overhead panel to the ON position.
- (h) Put a maximum electrical load on the APU starter-generator.
- (i) Operate the APU in the loaded condition for 15 minutes.
- (j) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
  - 1) Look at the INPUT MONITORING page on the control display unit (CDU) display for the APU oil temperature (OIL TEMP).
    - a) With an electrical load applied on the APU, the oil temperature is less than 250°F (121°C).
  - 2) If maintenance message(s) show for the APU lubrication system, refer to the applicable Maintenance Message Index in the FIM.
- (k) Remove the electrical load from the APU starter-generator.
- (l) Set the two APU GEN switches to the OFF position.
- (m) Operate the APU in the no load condition for a minimum of one minute.
- (n) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

SUBTASK 49-91-21-640-001

- (4) Make sure the APU oil system is full. To check the oil level, do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.

#### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-21-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (c) Install the retainer pin in the rod end of the forward hold-open rod.
- (d) Install the retainer pin to the spring clip on the aft hold-open rod.
- (e) Close the APU Cowl Door, 315A.
- (f) Disconnect the two hold-open rods from the two brackets.
- (g) Close the three latches.

————— END OF TASK —————

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OIL COOLER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
  - (1) A removal of the oil cooler
  - (2) An installation of the oil cooler.
- B. The oil cooler is installed on the eductor housing.

**TASK 49-91-41-000-801**

2. Oil Cooler Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-91-41-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-91-41-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-41-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.

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- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### E. Oil Cooler Removal

SUBTASK 49-91-41-020-001

**WARNING:** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

**WARNING:** DO NOT LET HOT OIL GET ON YOU. PUT ON PROTECTIVE CLOTHES, GOGGLES, AND EQUIPMENT OR LET THE APU BECOME COOL. HOT OIL CAN BURN YOU.

**WARNING:** DO NOT LET THE OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

**CAUTION:** DO NOT LET OIL GET ON THE APU OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE OIL WHEN IT FALLS ON THEM. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

- (1) Do these steps to disconnect the supply and return tubes [1], [3] for the oil cooler:
  - (a) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203 below the oil cooler [7].
  - (b) Loosen the nut [6] that attaches the supply tube [1] to the oil cooler [7].
  - (c) Turn the tube retainer on the supply tube [1] counterclockwise until the flange disengages from the stud.
  - (d) Loosen the nut [5] that attaches the return tube [3] to the oil cooler [7].
  - (e) Turn the tube retainer on the return tube [3] counterclockwise until the flange disengages from the stud.
  - (f) Disconnect the supply tube [1] from the oil cooler [7].
  - (g) Disconnect the return tube [3] from the oil cooler [7].
  - (h) Use the 1 U.S.-gal (3.81 l) oil resistant container, STD-203 to drain the oil from the supply and return tubes [1], [3].
  - (i) Remove the two packings [2] and two packings [4] from the supply and return tubes [1], [3].
    - 1) Discard the two packings [2] and two packings [4].
  - (j) Make sure you install all necessary protection covers.

SUBTASK 49-91-41-020-002

- (2) Do these steps to remove the oil cooler [7]:
  - (a) Install the plugs or covers in the oil cooler ports.

**NOTE:** This will prevent oil spillage during the removal.
  - (b) Loosen the eight bolts [11] that attach the oil cooler [7] to the eductor housing.
  - (c) Push up on the oil cooler [7] until the oil cooler flange disengages from the eductor housing flange.

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(d) Remove the oil cooler [7].

NOTE: The oil cooler [7] with the oil weighs approximately 20 pounds (9.0 kilograms).

(e) Remove the plugs or covers from the oil cooler ports.

(f) Use the 1 U.S.-gal (3.81 l) oil resistant container, STD-203 to drain the oil from the oil cooler [7].

(g) Make sure you install all necessary protection covers.

(h) Remove the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

SUBTASK 49-91-41-020-003

(3) Do these steps to remove the fire shield [9] for the oil cooler:

NOTE: It is necessary to remove the fire shield from the defective oil cooler [7]. You must install the same fire shield to the new or serviceable oil cooler [7].

(a) Remove the three screws [12] that attach the fire shield [9] to the oil cooler [7].

(b) Remove the two bolts [10] that attach the two brackets [8] to the oil cooler [7].

(c) Remove the fire shield [9] and the two brackets [8].

————— **END OF TASK** —————

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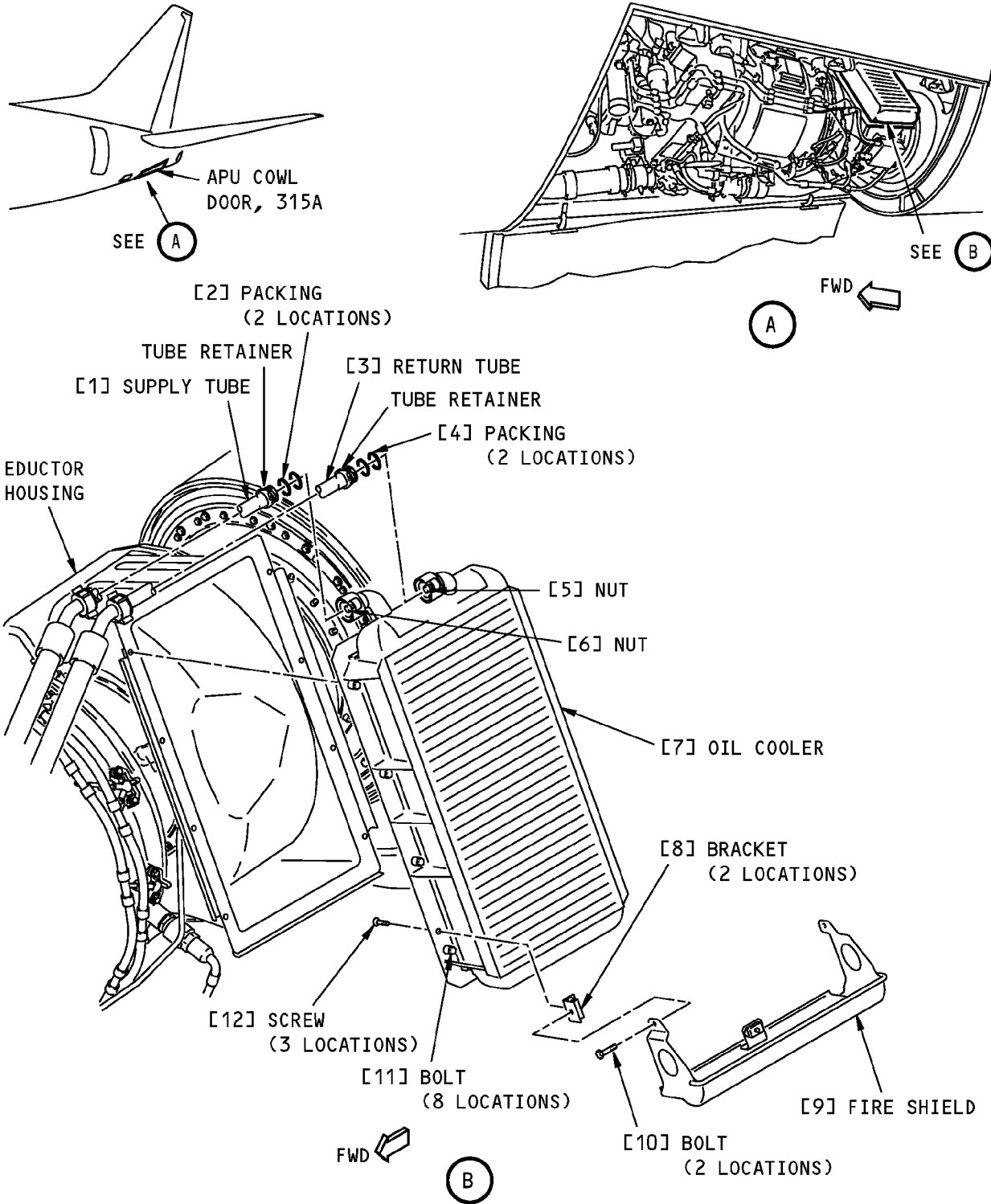
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**Oil Cooler Installation  
Figure 401/49-91-41-990-801**

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#### TASK 49-91-41-400-801

#### 3. Oil Cooler Installation

(Figure 401)

##### A. References

Reference	Title
12-13-31-610-803	Fill the APU Gearbox (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

##### B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

##### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	49-11-01-01-015	HAP 001-013, 015-026, 028-030
		49-11-01-02-015	HAP 031-054, 101-999
4	Packing	49-11-01-01-015	HAP 001-013, 015-026, 028-030
		49-11-01-02-015	HAP 031-054, 101-999
7	Oil cooler	49-91-41-01-005	HAP 001-013, 015-026, 028-030
		49-91-41-02-005	HAP 031-054, 101-999

##### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

##### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### F. Procedure

SUBTASK 49-91-41-420-003

- (1) Do these steps to install the fire shield [9] to the new or serviceable oil cooler [7]:
  - (a) Install the two brackets [8] and fire shield [9] on the oil cooler [7] with the two bolts [10].
    - 1) Tighten the two bolts [10] to 30 pound-inches (3.4 newton-meters).
  - (b) Install the three screws [12] that attach the two brackets [8] and fire shield [9] to the oil cooler [7].
    - 1) Tighten the three screws [12] to 22 pound-inches (2.5 newton-meters).

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SUBTASK 49-91-41-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

(2) Do these steps to install the oil cooler [7]:

**CAUTION:** DO NOT MIX TWO TYPES OF OIL WHEN YOU ADD OR REPLACE THE OIL IN THE APU. IT IS PERMITTED TO MIX DIFFERENT BRANDS OF OIL WITH THE SAME TYPE OF OIL WHEN YOU ADD OR REPLACE THE OIL IN THE APU. A MIXTURE OF TWO TYPES OF OIL IN THE APU CAN CAUSE DAMAGE TO THE APU.

**CAUTION:** DO NOT OVERFILL THE OIL COOLER TO PREVENT AN OIL SPILL. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

(a) Slowly fill the oil cooler [7] with 2 quarts (1.9 liters) of the same type of oil that is already in the APU gearbox.

**NOTE:** The oil capacity of the oil cooler [7] is 2.4 quarts (2.3 liters).

(b) Install the plugs or covers in the oil cooler ports to prevent an oil spill.

(c) Install the oil cooler [7] on the eductor housing.

(d) Make sure the flange on the bottom of the oil cooler [7] engages the eductor housing flange.

(e) Tighten the eight bolts [11] to 50 pound-inches (5.7 newton-meters).

SUBTASK 49-91-41-420-002

(3) Do these steps to connect the supply and return tubes [1], [3] for the oil cooler:

(a) Remove the plugs or covers from the oil cooler ports.

(b) Lubricate the two new packings [2] and two new packings [4] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.

(c) Install the two packings [2] on the supply tube [1].

(d) Install the two packing [4] on the return tube [3].

(e) Connect the return tube [3] to the oil cooler [7].

(f) Connect the supply tube [1] to the oil cooler [7].

(g) Turn the tube retainer on the supply tube [1] clockwise until the flange engages the stud.

(h) Tighten the nut [6] to 40 pound-inches (4.5 newton-meters).

(i) Turn the tube retainer on the return tube [3] clockwise until the flange engages the stud.

(j) Tighten the nut [5] to 40 pound-inches (4.5 newton-meters).

SUBTASK 49-91-41-610-001

(4) Do this task: Fill the APU Gearbox, TASK 12-13-31-610-803.

## G. Oil Cooler Installation Test

SUBTASK 49-91-41-860-003

(1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-41-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-91-41-790-001

- (3) Do the installation test for the oil cooler:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Operate the APU for a minimum of five minutes.
  - (c) During the APU operation, examine the oil cooler for signs of oil leakage.
  - (d) If you find oil leakage, do these steps to repair the leakage:
    - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
    - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
    - 3) Repair the cause of the oil leakage.
    - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
    - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
    - 6) During the APU operation, examine the oil cooler for signs of oil leakage.
    - 7) If you find oil leakage, do the leakage repair again.
  - (e) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

SUBTASK 49-91-41-610-002

- (4) Do this task: Fill the APU Gearbox, TASK 12-13-31-610-803.

**H. Put the Airplane Back to Its Usual Condition**

SUBTASK 49-91-41-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

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## OIL COOLER - INSPECTION/CHECK

### 1. General

A. This procedure has the task to do an inspection of the oil cooler. The oil cooler is installed on the eductor housing.

#### **TASK 49-91-41-200-801**

### 2. Oil Cooler Inspection

(Figure 601)

#### A. References

Reference	Title
49-91-41-000-801	Oil Cooler Removal (P/B 401)
49-91-41-400-801	Oil Cooler Installation (P/B 401)

#### B. Tools/Equipment

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1087	Source - Steam, Saturated

#### C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

#### D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	49-11-01-01-015	HAP 001-013, 015-026, 028-030
4	Packing	49-11-01-01-015	HAP 031-054, 101-999
7	Oil cooler	49-11-01-02-015	HAP 031-054, 101-999
		49-91-41-01-005	HAP 001-013, 015-026, 028-030
		49-91-41-02-005	HAP 031-054, 101-999

#### E. Location Zones

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right

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### F. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

### G. Prepare for the Inspection

SUBTASK 49-91-41-010-002

(1) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### H. Procedure

SUBTASK 49-91-41-210-001

(1) Do these steps to inspect the oil cooler [7]:

- (a) Visually examine the oil cooler [7], supply tube [1] and return tube [3] for oil leakage.

**NOTE:** You examine all of the sides of the oil cooler [7] that you can get access from the APU compartment.

- 1) Replace the oil cooler [7] if you find signs of oil leakage. These are the tasks:
  - Oil Cooler Removal, TASK 49-91-41-000-801
  - Oil Cooler Installation, TASK 49-91-41-400-801
- 2) If you find signs of oil leakage from the supply tube [1] and/or return tube [3], repair the oil leakage:
  - a) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203 below the oil cooler [7].
  - b) Loosen the nut(s) [5], [6] that attach the supply tube [1] and/or return tube [3] that have oil leakage to the oil cooler [7].

**NOTE:** Do not loosen the nut or disconnect the other tube that has no oil leakage.
  - c) Turn the tube retainer(s) on the tube(s) counterclockwise until the flange(s) disengage from the stud(s).
  - d) Disconnect the tube(s) from the oil cooler [7].
  - e) Use the 1 U.S.-gal (3.81 l) oil resistant container, STD-203 to drain the oil from the tube(s).
  - f) Remove the two packings [2] and/or two packings [4] from the tube(s).
  - g) Discard the two packings [2] and/or two packings [4].
  - h) Lubricate the two new packings [2] and/or two new packings [4] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.

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- i) Install the two packings [2] and/or two packings [4] on the tube(s).
  - j) Connect the tube(s) to the oil cooler [7].
  - k) Turn the tube retainer(s) on the tube(s) clockwise until the flange(s) engage the stud(s).
    - l) Tighten the nut(s) [5], [6] to 40 pound-inches (4.5 newton-meters).
  - m) If you find signs of oil leakage again, repair or replace the tube(s).
  - n) Replace the oil cooler [7] if you find signs of oil leakage again. These are the tasks:
    - Oil Cooler Removal, TASK 49-91-41-000-801
    - Oil Cooler Installation, TASK 49-91-41-400-801
- (b) Visually examine the oil cooler [7] for missing and damaged parts.
- 1) If you find missing or damaged parts, install the missing parts or replace the damaged parts.
- (c) Visually examine the oil cooler [7] for cracks, blockage of unwanted materials and surface contamination.
- 1) No cracks are permitted.
  - 2) If you find blockage of unwanted materials, remove the blockage.
  - 3) If you find external surface contamination, clean the oil cooler [7]:
    - a) Clean the surfaces of the oil cooler [7] with alcohol, B00130 and a cotton wiper, G00034.
    - b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surfaces of the oil cooler [7].

**NOTE:** It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surfaces of the oil cooler [7].

- 4) If you find more than 25 percent of the total area for the air fins on the oil cooler [7] with internal surface contamination and blockage of unwanted materials, replace the oil cooler or steam clean the oil cooler. These are the tasks:
  - a) Replace the oil cooler. These are the tasks:
    - Oil Cooler Removal, TASK 49-91-41-000-801
    - Oil Cooler Installation, TASK 49-91-41-400-801
  - b) Do these steps in this task to steam clean the oil cooler [7]:
    - < 1 > Remove the oil cooler. To remove it, do this task: Oil Cooler Removal, TASK 49-91-41-000-801.
    - < 2 > Make sure the plugs or covers are installed in the oil cooler ports and tape, as necessary, to prevent any internal contamination.

**CAUTION:** MAKE SURE THAT THE STEAM PRESSURE DOES NOT CAUSE DAMAGE OR BEND THE ALUMINUM FINS ON THE OIL COOLER. DAMAGE TO THE OIL COOLER CAN OCCUR.

- < 3 > Use the steam source, STD-1087 to clean the surfaces of the air fins and oil cooler.

**NOTE:** It is recommended that you use a pressure of 65 ± 5 psig (448.2 ± 34.5 kPa) of steam to clean the surfaces of the air fins and oil cooler.

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< 4 > Clean the surfaces of the air fins and oil cooler [7] and remove the unwanted water with alcohol, B00130 and a cotton wiper, G00034.

< 5 > Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the surfaces of the oil cooler [7].

NOTE: It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the surfaces of the oil cooler [7].

< 6 > Install the oil cooler. To install it, do this task: Oil Cooler Installation, TASK 49-91-41-400-801.

(d) Visually examine these components of the oil cooler [7]:

1) Air fins for bends.

a) If you find the air fins are bent by less than 10 percent of the total area and you can get access to the air fins, use needle-nosed pliers to make the air fins straight.

2) Two side plates for gouges and dents:

a) Gouges not more than 0.03 inch (0.76 mm) in depth.

b) Gouges not longer than 4.2 inches (107 mm).

c) The width of the gouges is not more than 0.65 inch (16.5 mm).

d) Dents not more than 0.06 inch (1.52 mm) in depth.

e) Dents not longer than the width of the side plate.

f) Replace the oil cooler [7] if the visual inspection is not in the limits. These are the tasks:

- Oil Cooler Removal, TASK 49-91-41-000-801

- Oil Cooler Installation, TASK 49-91-41-400-801

#### I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-41-410-002

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

(a) Remove the two retainer pins from the two hold-open rods in the APU compartment.

(b) Disconnect the two hold-open rods from the two brackets.

(c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.

(d) Install the retainer pin in the rod end of the forward hold-open rod.

(e) Install the retainer pin to the spring clip on the aft hold-open rod.

(f) Close the APU Cowl Door, 315A.

(g) Close the three latches.

————— END OF TASK —————

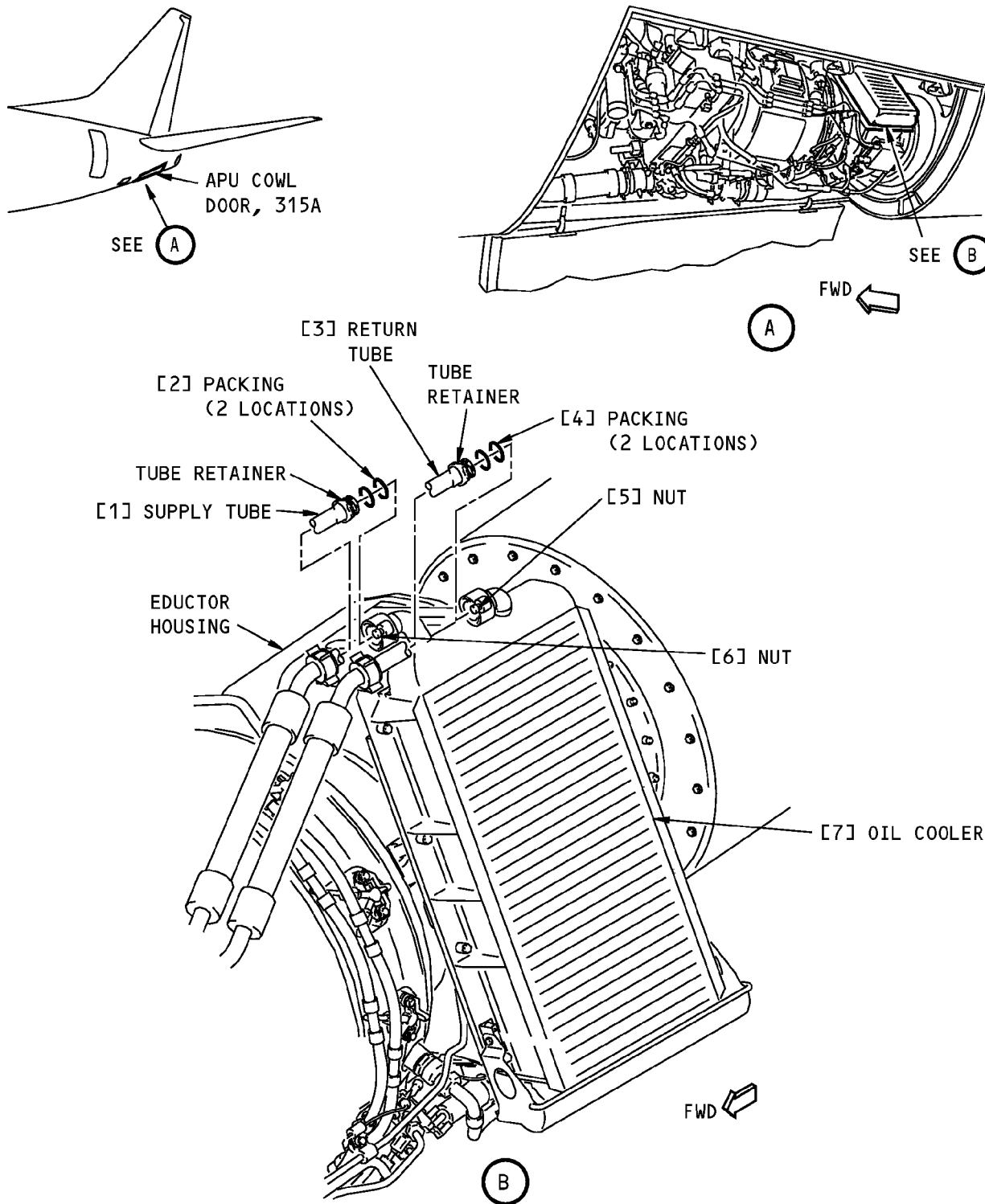
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**Oil Cooler Inspection  
Figure 601/49-91-41-990-802**

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## AIRCRAFT MAINTENANCE MANUAL

### EDUCTOR INLET DUCT - REMOVAL/INSTALLATION

#### 1. General

A. This procedure has these tasks:

- (1) A removal of the eductor inlet duct
- (2) An installation of the eductor inlet duct.

B. The eductor inlet duct is installed between the 1156 bulkhead and the upper aft fairing.

#### **TASK 49-91-71-000-801**

#### 2. Eductor Inlet Duct Removal

(Figure 401)

A. References

Reference	Title
49-81-11-000-801	Exhaust Duct Muffler Removal (P/B 401)
49-81-31-000-801	Aft Fairing Assembly Removal (P/B 401)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

C. Access Panels

Number	Name/Location
315A	APU Cowl Door
318BR	Tailcone Access Door

D. Prepare for the Removal

SUBTASK 49-91-71-860-005

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-91-71-860-006

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-71-010-003

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

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- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

SUBTASK 49-91-71-010-004

- (4) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

### E. Eductor Inlet Duct Removal

SUBTASK 49-91-71-020-001

- (1) Do these steps to remove the eductor inlet duct [10]:
- (a) Remove the exhaust duct muffler. To remove it, do this task: Exhaust Duct Muffler Removal, TASK 49-81-11-000-801.
  - (b) Remove the 11 screws [1] and 11 washers [2] that attach the eductor sleeve [3] to the eductor inlet duct [10].
  - (c) Remove the eductor sleeve [3].
  - (d) Loosen the 16 bolts [7] and four screws [4] that attach the support ring bracket [6] to the 1156 bulkhead.
  - (e) Remove the upper aft fairing [9]. To remove it, do this task: Aft Fairing Assembly Removal, TASK 49-81-31-000-801.
  - (f) Remove the 13 screws [11] and 13 washers [12] that attach the eductor inlet duct [10] to the 1156 bulkhead.
  - (g) Slowly remove the eductor inlet duct [10] from the tail cone compartment.  
NOTE: The weight of the eductor inlet duct [10] is approximately 9 pounds (4.1 kg).
  - (h) Make sure you install all necessary protection covers.

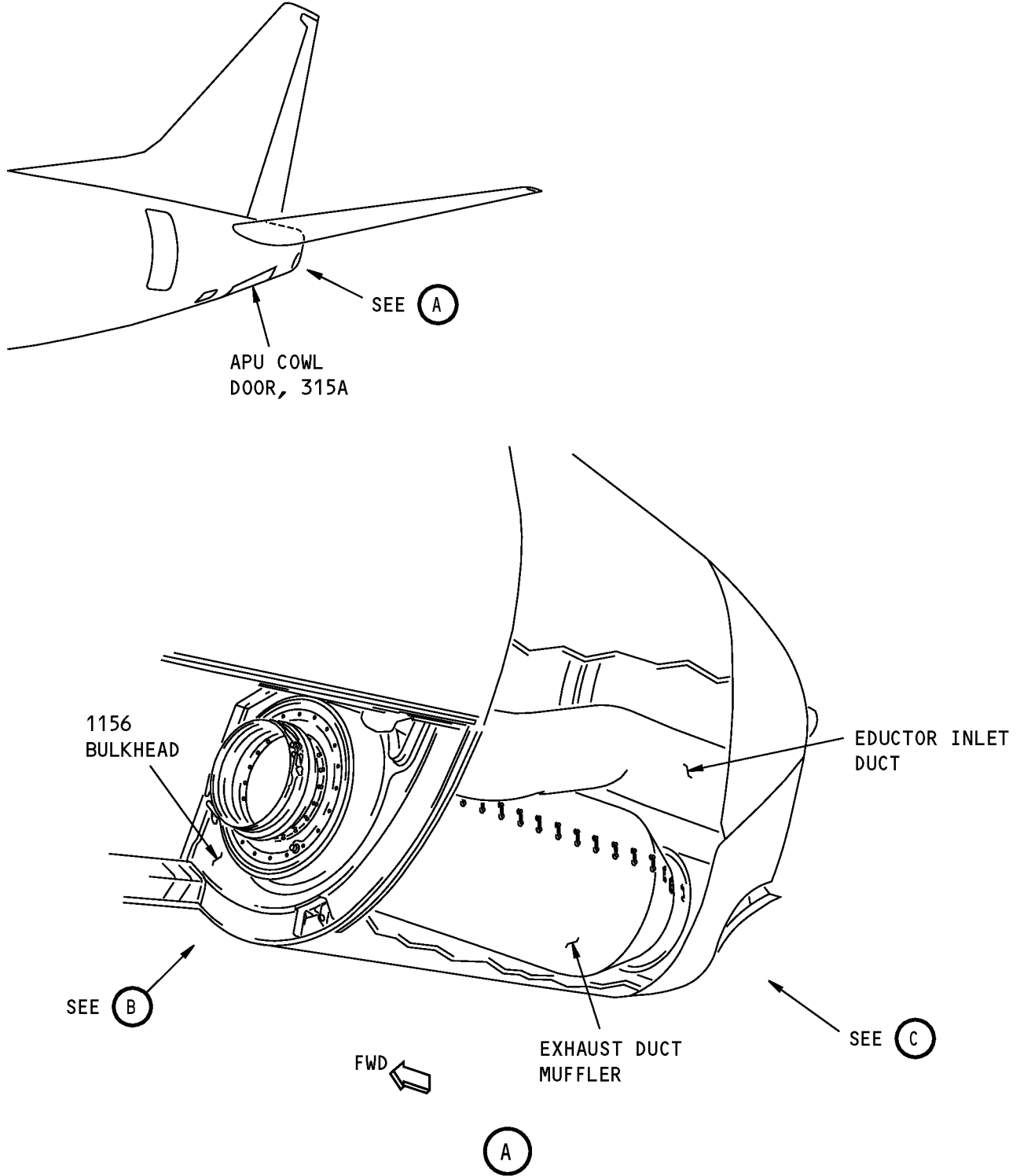
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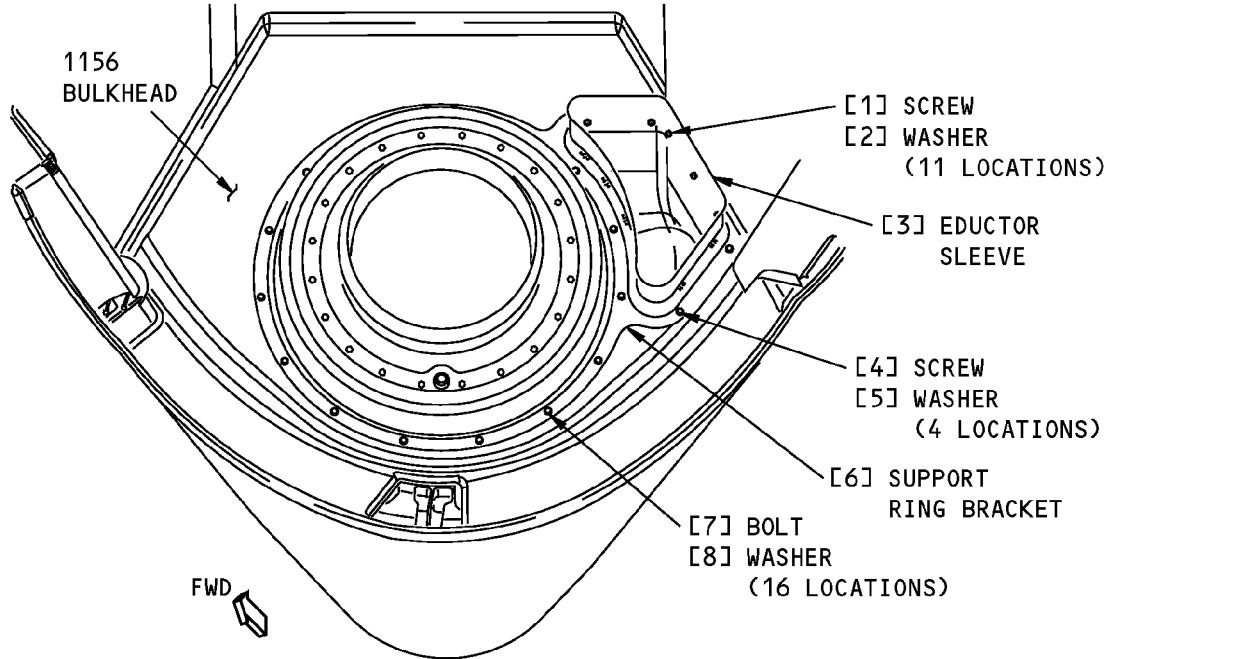
**Eductor Inlet Duct Installation  
Figure 401 (Sheet 1 of 2)/49-91-71-990-801**

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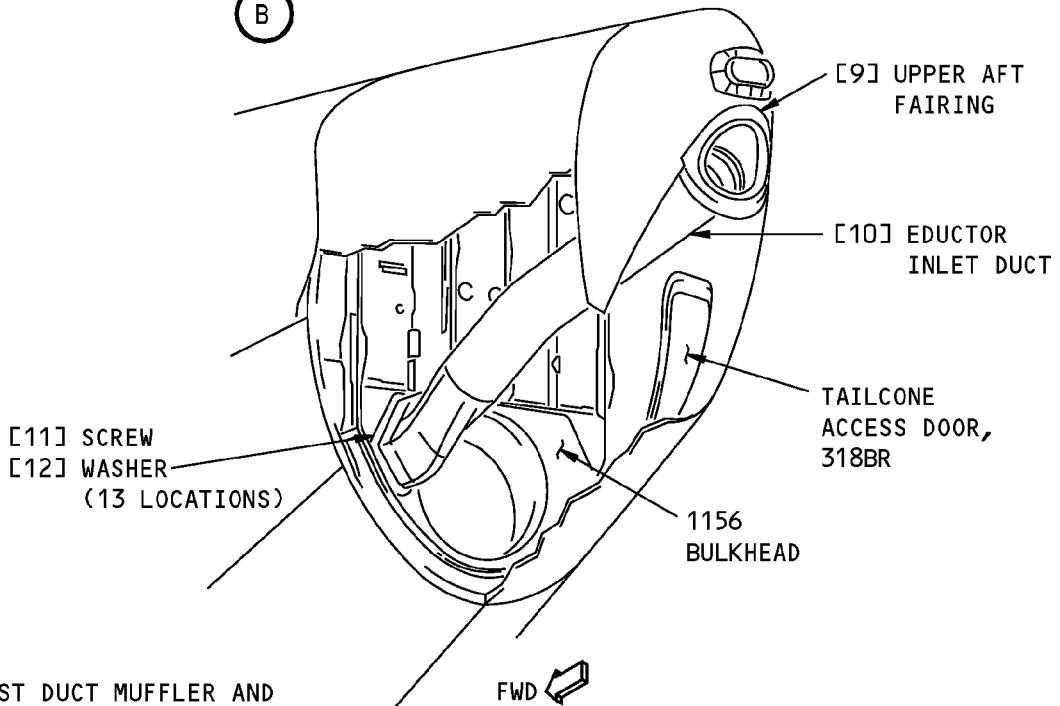
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(VIEW IN THE AFT DIRECTION)

(B)



**NOTE:** EXHAUST DUCT MUFFLER AND LOWER AFT FAIRING ARE REMOVED.

(C)

**Eductor Inlet Duct Installation  
Figure 401 (Sheet 2 of 2)/49-91-71-990-801**

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#### TASK 49-91-71-400-801

### 3. Eductor Inlet Duct Installation

(Figure 401)

#### A. References

Reference	Title
49-81-11-400-801	Exhaust Duct Muffler Installation (P/B 401)
49-81-31-400-801	Aft Fairing Assembly Installation (P/B 401)

#### B. Consumable Materials

Reference	Description	Specification
A00557	Sealant - Chemical Resistant - DC FS3452	

#### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
9	Upper aft fairing	49-81-31-01-040	HAP ALL
		53-53-00-01-495	HAP 012, 013, 015-026
10	Eductor inlet duct	49-91-71-01-005	HAP 001-013, 015-026, 028-030
		49-91-71-01A-005	HAP 031-054, 101-999

#### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

#### E. Access Panels

Number	Name/Location
315A	APU Cowl Door
318BR	Tailcone Access Door

#### F. Procedure

SUBTASK 49-91-71-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the eductor inlet duct [10]:
  - (a) If the eductor inlet duct [10] is a new part or a different part that was not removed from this airplane, then do these steps:
    - 1) Remove the two screws [1] and two washers [2] that attach the eductor sleeve [3] to the eductor inlet duct [10] temporarily.
 

NOTE: The eductor sleeve [3] is a part of the eductor inlet duct [10].

      - a) Discard the two screws [1] and two washers [2].
    - 2) Remove the eductor sleeve [3].

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- (b) Apply a thin layer of DC FS3452 sealant, A00557 around the inner diameter of the eductor duct seal.

NOTE: The eductor duct seal is installed at the aft end of the eductor inlet duct [10].

- (c) Carefully put the eductor inlet duct [10] into the tail cone compartment and through the 1156 bulkhead.

NOTE: The weight of the eductor inlet duct [10] is approximately 9 pounds (4.1 kg).

- (d) Install the upper aft fairing [9]. To install it, do this task: Aft Fairing Assembly Installation, TASK 49-81-31-400-801.
(e) Install the 13 washers [12] and 13 screws [11] that attach the eductor inlet duct [10] to the 1156 bulkhead.
(f) Tighten the 16 bolts [7] and four screws [4] that attach the support ring bracket [6] to the 1156 bulkhead.
(g) Install the eductor sleeve [3] to the eductor inlet duct [10] with the 11 washers [2] and 11 screws [1].
(h) Install the exhaust duct muffler. To install it, do this task: Exhaust Duct Muffler Installation, TASK 49-81-11-400-801.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-71-860-007

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Table with 4 columns: Row, Col, Number, Name. Row B, Col 19, Number C01344, Name APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Table with 4 columns: Row, Col, Number, Name. Row A, Col 14, Number C00033, Name AUX POWER UNIT CONT

SUBTASK 49-91-71-860-008

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-91-71-410-003

- (3) To close the access panel, do these steps:

Table with 2 columns: Number, Name/Location. Row 315A, Name/Location APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
(b) Disconnect the two hold-open rods from the two brackets.
(c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
(d) Install the retainer pin in the rod end of the forward hold-open rod.
(e) Install the retainer pin to the spring clip on the aft hold-open rod.
(f) Close the APU Cowl Door, 315A.
(g) Close the three latches.

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SUBTASK 49-91-71-410-004

(4) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

————— **END OF TASK** —————

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## EDUCTOR INLET DUCT - INSPECTION/CHECK

### 1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has the task to inspect the eductor inlet duct.
- C. The eductor inlet duct is installed between the left side of the 1156 bulkhead and the upper fairing assembly on the tail cone.

#### **TASK 49-91-71-200-801**

### 2. Eductor Inlet Duct Inspection

#### A. General

- (1) This procedure is a scheduled maintenance task.

#### B. References

Reference	Title
49-91-71-000-801	Eductor Inlet Duct Removal (P/B 401)
49-91-71-400-801	Eductor Inlet Duct Installation (P/B 401)

#### C. Location Zones

Zone	Area
315	APU Compartment - Left
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

#### D. Access Panels

Number	Name/Location
315A	APU Cowl Door
318BR	Tailcone Access Door

#### E. Prepare for the Inspection

SUBTASK 49-91-71-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-91-71-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-71-010-001

- (3) Open this access door. To open this access door, do these steps:

Number	Name/Location
315A	APU Cowl Door

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- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

SUBTASK 49-91-71-010-002

- (4) Open this access door:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

### F. Procedure

SUBTASK 49-91-71-210-001

- (1) Do these steps to inspect the eductor inlet duct from the APU compartment and tail cone compartment:
  - (a) Visually examine the forward end and inner surfaces of the eductor inlet duct that you can get access for blockage and contamination.
    - 1) If you find blockage or contamination, remove the blockage or contamination from the eductor inlet duct.
  - (b) Visually examine the inner and outer surfaces of the eductor inlet duct for holes and cracks.
    - 1) If you can see holes or cracks, replace the eductor inlet duct. These are the tasks:
      - Eductor Inlet Duct Removal, TASK 49-91-71-000-801,
      - Eductor Inlet Duct Installation, TASK 49-91-71-400-801.
  - (c) Visually examine the inner and outer surfaces of the eductor inlet duct for separations of the fiberglass material.
    - 1) Separations of one or two plies of fiberglass material are permitted.
    - 2) If you see separations of more than two plies of fiberglass material, replace the eductor inlet duct. These are the tasks:
      - Eductor Inlet Duct Removal, TASK 49-91-71-000-801,
      - Eductor Inlet Duct Installation, TASK 49-91-71-400-801.

SUBTASK 49-91-71-210-002

- (2) Do these steps to inspect the eductor inlet duct from the upper fairing assembly on the tail cone:
  - (a) Visually examine the aft end and inner surfaces of the eductor inlet duct that you can get access for blockage and contamination.
    - 1) If you find blockage or contamination, remove the blockage or contamination from the eductor inlet duct.
  - (b) Visually examine the inner surfaces of the eductor inlet duct for holes and cracks.
    - 1) If you can see holes or cracks, replace the eductor inlet duct. These are the tasks:
      - Eductor Inlet Duct Removal, TASK 49-91-71-000-801,
      - Eductor Inlet Duct Installation, TASK 49-91-71-400-801.

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- (c) Visually examine the inner surfaces of the eductor inlet duct for separations of the fiberglass material.
1) Separations of one or two plies of fiberglass material are permitted.
2) If you see separations of more than two plies of fiberglass material, replace the eductor inlet duct. These are the tasks:
• Eductor Inlet Duct Removal, TASK 49-91-71-000-801,
• Eductor Inlet Duct Installation, TASK 49-91-71-400-801.
(d) Visually examine the inner surfaces of the eductor inlet duct for damaged painted surfaces which include signs of paint peeling and missing paint from the APU compartment and upper fairing assembly on the tail cone.
1) Signs of paint peeling and/or missing paint are permitted on the inner surfaces of the eductor inlet duct. The APU can continue in service with no further maintenance action.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-71-410-005

- (1) Close this access door:

Table with 2 columns: Number, Name/Location. Row 1: 318BR, Tailcone Access Door

SUBTASK 49-91-71-410-006

- (2) Close this access door. To close this access door, do these steps:

Table with 2 columns: Number, Name/Location. Row 1: 315A, APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
(b) Disconnect the two hold-open rods from the two brackets.
(c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
(d) Install the retainer pin in the rod end of the forward hold-open rod.
(e) Install the retainer pin to the spring clip on the aft hold-open rod.
(f) Close the APU Cowl Door, 315A.
(g) Close the three latches.

SUBTASK 49-91-71-860-003

- (3) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Table with 4 columns: Row, Col, Number, Name. Row 1: B, 19, C01344, APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Table with 4 columns: Row, Col, Number, Name. Row 1: A, 14, C00033, AUX POWER UNIT CONT

SUBTASK 49-91-71-860-004

- (4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

END OF TASK

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### MAGNETIC DRAIN PLUG - REMOVAL/INSTALLATION

#### 1. General

A. This procedure has these tasks:

- (1) A removal of the magnetic drain plug assembly
- (2) An installation of the magnetic drain plug assembly.

B. The magnetic drain plug assembly is installed on the front of the APU gearbox. The magnetic drain plug assembly has a magnetic element and a plug.

C. When you remove the plug from the APU gearbox, the oil will drain from the APU gearbox. When you examine the oil for metal particles, you remove the magnetic element and leave the plug on the APU gearbox to prevent the oil from draining out of the APU gearbox.

D. In this procedure, the magnetic drain plug assembly is referred to as the plug assembly.

#### **TASK 49-91-81-000-801**

#### 2. Magnetic Drain Plug Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liters)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-91-81-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-91-81-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-91-81-010-001

(3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### E. Magnetic Drain Plug Removal

SUBTASK 49-91-81-020-001

**WARNING:** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

(1) Do these steps to remove the plug assembly [4]:

**NOTE:** The plug assembly [4] has the magnetic element [3] and the plug [5].

- (a) Put the oil resistant container (5 gal)(19 Liters), STD-1055 below the plug assembly [4].
- (b) Remove the magnetic element [3] from the plug [5].

**NOTE:** Push in on the magnetic element and turn the magnetic element counterclockwise for the removal.

- (c) Remove the packing [2] from the magnetic element [3].
  - 1) Discard the packing [2].

**CAUTION:** IF THE OIL LEVEL IS AT THE TOP OF THE OIL SIGHT GLASS, THE OIL CAN FLOW OUT WHEN THE OIL FILL CAP IS LOOSENED. HOT OIL CAN BURN YOU.

- (d) Pull the latch handle away from the oil fill cap.
- (e) Loosen the oil fill cap to help the oil drain from the APU gearbox.
- (f) Remove the plug [5] from the APU gearbox.
- (g) Use the oil resistant container (5 gal)(19 Liters), STD-1055 to drain the oil from the APU gearbox.
- (h) Remove the packing [1] from the plug [5].
  - 1) Discard the packing [1].
- (i) Close the oil fill cap.
- (j) Engage the latch handle on the oil fill cap.
- (k) Make sure you install all necessary protection covers.
- (l) Remove the oil resistant container (5 gal)(19 Liters), STD-1055.

————— **END OF TASK** —————

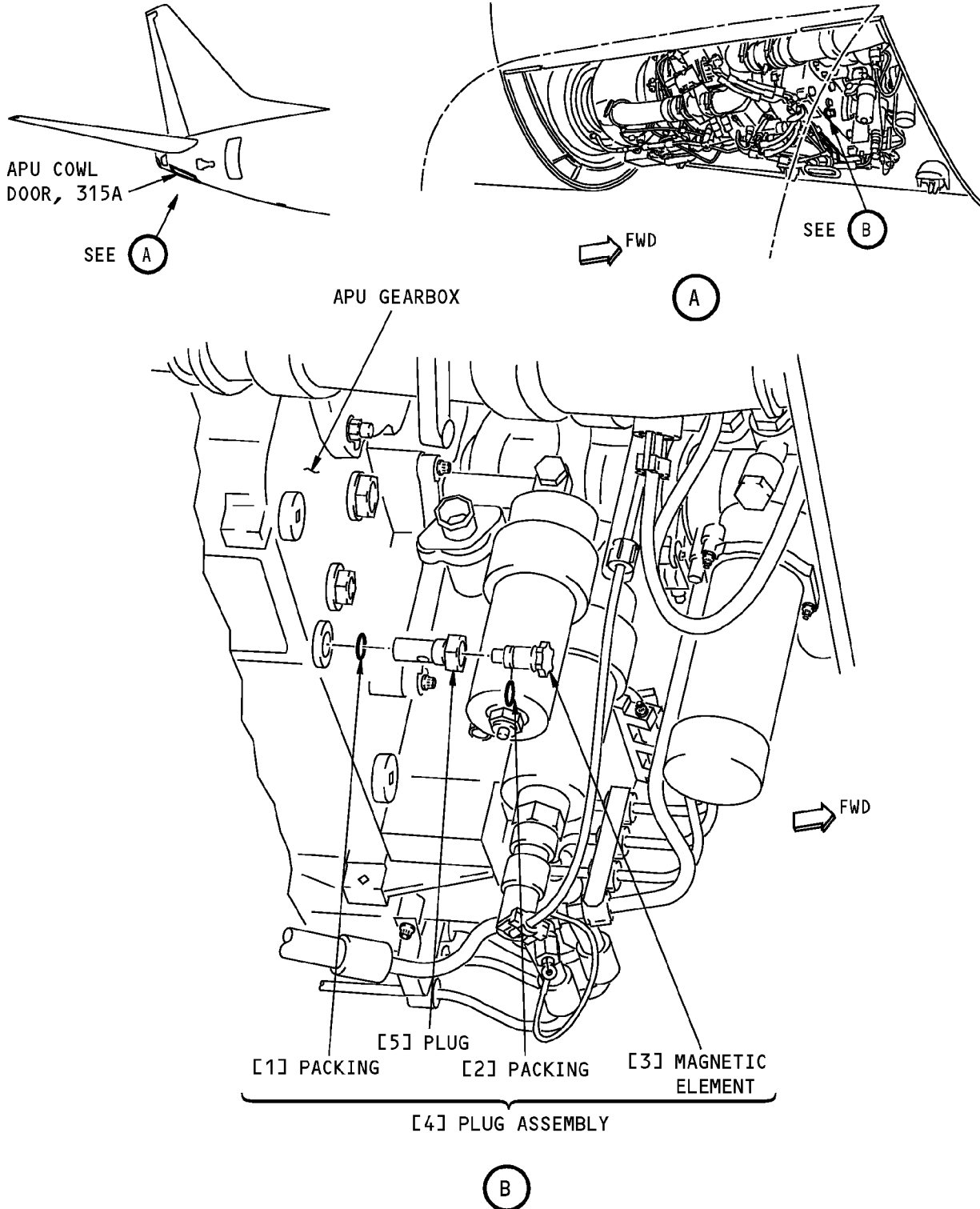
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**Magnetic Drain Plug Installation**  
**Figure 401/49-91-81-990-801**

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TASK 49-91-81-400-801

#### 3. Magnetic Drain Plug Installation

(Figure 401)

##### A. References

Reference	Title
12-13-31-610-803	Fill the APU Gearbox (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

##### B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G01048	Lockwire - Corrosion Resistant Steel (0.032 In. Dia.)	NASM20995~ C32

##### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Packing	49-91-81-01-040	HAP 001-013, 015-026, 028-030
2	Packing	49-91-81-02-035	HAP 031-054, 101-999
		49-91-81-01-030	HAP 001-013, 015-026, 028-030
4	Plug assembly	49-91-81-02-030	HAP 031-054, 101-999
		49-91-81-01-025	HAP 001-013, 015-026, 028-030
		49-91-81-02-025	HAP 031-054, 101-999

##### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

##### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### F. Procedure

SUBTASK 49-91-81-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

(1) Do these steps to install the plug assembly [4]:

**NOTE:** The plug assembly [4] has the magnetic element [3] and the plug [5]. You install the plug [5] in the APU gearbox first before you install the magnetic element [3].

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- (a) Lubricate the new packing [1] and new packing [2] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.
- (b) Install the packing [1] on the plug [5].
- (c) Install the packing [2] on the magnetic element [3].
- (d) Install the plug [5] in the APU gearbox.
  - 1) Tighten the plug [5] to 80-90 pound-inches (9.0-10.1 newton-meters).
- (e) Install the lockwire, G01048 on the plug [5].
- (f) Install the magnetic element [3] in the plug [5].

**NOTE:** Push in on the magnetic element [3] and turn the magnetic element clockwise for the installation.

SUBTASK 49-91-81-610-001

- (2) Do this task: Fill the APU Gearbox, TASK 12-13-31-610-803.

#### G. Magnetic Drain Plug Installation Test

SUBTASK 49-91-81-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-81-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-91-81-790-001

- (3) Do the installation test for the plug assembly [4]:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Operate the APU for a minimum of five minutes.
  - (c) During the APU operation, examine the plug assembly for signs of oil leakage.
  - (d) If you find oil leakage, do these steps to repair the leakage:
    - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
    - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
    - 3) Repair the cause of the oil leakage.
    - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
    - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
    - 6) During the APU operation, examine the plug assembly for signs of oil leakage.
    - 7) If you find oil leakage, do the leakage repair again.
  - (e) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-81-410-001

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— END OF TASK —————

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## MAGNETIC DRAIN PLUG - INSPECTION/CHECK

### 1. General

- A. This procedure has the task to inspect the magnetic element for the magnetic drain plug.
- B. The magnetic drain plug is installed on the front of the APU gearbox. The magnetic drain plug has a magnetic element and a plug.
- C. The magnetic element retains metal particles from the engine oil. The magnetic element is used to isolate internal engine problems.

### **TASK 49-91-81-200-801**

### 2. Magnetic Drain Plug Inspection

(Figure 601)

#### A. References

Reference	Title
49-11-00-000-801	APU Power Plant Removal (P/B 401)
49-11-00-400-801	APU Power Plant Installation (P/B 401)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

#### B. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

#### C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

#### D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Plug assembly	49-91-81-01-025	HAP 001-013, 015-026, 028-030
		49-91-81-02-025	HAP 031-054, 101-999
2	Packing	49-91-81-01-030	HAP 001-013, 015-026, 028-030
		49-91-81-02-030	HAP 031-054, 101-999

#### E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

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## F. Access Panels

Number	Name/Location
315A	APU Cowl Door

## G. Prepare for the Inspection

SUBTASK 49-91-81-860-005

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-91-81-860-006

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-81-010-002

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Open the three latches.
- (b) Open the APU Cowl Door, 315A.
- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

SUBTASK 49-91-81-020-002

**WARNING:** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

- (4) Do these steps to remove the magnetic element [1] from the plug:

- (a) Remove the magnetic element [1] from the plug.

**NOTE:** Push in on the magnetic element and turn the magnetic element counterclockwise for the removal.

**NOTE:** The plug assembly [1] (magnetic drain plug) has the magnetic element and the plug.

- (b) Remove the packing [2] from the magnetic element [1].

- 1) Discard the packing [2].

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H. Magnetic Drain Plug Inspection

SUBTASK 49-91-81-210-001

(1) Do these steps to inspect the magnetic element [1] for metal particles:

NOTE: Metal particles on the magnetic element give an indication of internal damage to the engine. If you see metal particles on the magnetic element, examine the engine to find the cause and quantity of the damage.

- (a) If the magnetic element is free of metal particles, the APU is satisfactory.
(b) A small quantity of metal particles that are not silver color are permitted.
(c) Silver color particles are not permitted.

NOTE: Silver color particles give an indication of damage to the APU.

- 1) If you find silver color particles, replace the APU. These are the tasks:
- APU Power Plant Removal, TASK 49-11-00-000-801
- APU Power Plant Installation, TASK 49-11-00-400-801
(d) If you find a medium quantity of metal particles that are not silver color, then do these steps:
1) Clean the magnetic element with alcohol, B00130 and a cotton wiper, G00034.
2) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the magnetic element.

NOTE: It is recommended that you use a pressure of 30-60 psig (207-414 kPa) of air or nitrogen to dry the magnetic element.

- 3) Install the magnetic element [1]:
a) Lubricate the new packing [2] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.
b) Install the packing [2] on the magnetic element [1].
c) Install the plug assembly [1] in the APU gearbox.

NOTE: Push in on the magnetic element and turn the magnetic element clockwise for the installation.

NOTE: The plug assembly [1] (magnetic drain plug) has the magnetic element and the plug. You install the magnetic element with the packing [2] to the plug in the APU gearbox.

- 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
5) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Table with 4 columns: Row, Col, Number, Name. Row B, Col 19, Number C01344, Name APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Table with 4 columns: Row, Col, Number, Name. Row A, Col 14, Number C00033, Name AUX POWER UNIT CONT

- 6) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
7) Operate the APU for a minimum of 15 minutes.

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- 8) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
- 9) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
- 10) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

**WARNING:** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

- 11) Remove the magnetic element [1] from the plug:
    - a) Remove the magnetic element [1] from the plug.

NOTE: Push in on the magnetic element and turn the magnetic element counterclockwise for the removal.

NOTE: The plug assembly [1] (magnetic drain plug) has the magnetic element and the plug.
    - b) Remove the packing [2] from the magnetic element [1].
    - c) Discard the packing [2].
  - 12) Examine the magnetic element for metal particles.
  - 13) More metal particles on the magnetic element are not permitted.
    - a) If you find more metal particles, replace the APU. These are the tasks:
      - APU Power Plant Removal, TASK 49-11-00-000-801
      - APU Power Plant Installation, TASK 49-11-00-400-801
  - 14) If no more metal particles are found, the APU is satisfactory.
- (e) A large quantity of metal particles is not permitted.
- NOTE: A large quantity of metal particles give an indication of internal damage to the engine.
- 1) If you find a large quantity of metal particles, replace the APU. These are the tasks:
    - APU Power Plant Removal, TASK 49-11-00-000-801
    - APU Power Plant Installation, TASK 49-11-00-400-801
- (f) Install the magnetic element [1]:
- 1) Lubricate the new packing [2] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.
  - 2) Install the packing [2] on the magnetic element [1].

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3) Install the plug assembly [1] in the APU gearbox.

NOTE: Push in on the magnetic element and turn the magnetic element clockwise for the installation.

NOTE: The plug assembly [1] (magnetic drain plug) has the magnetic element and the plug. You install the magnetic element with the packing [2] to the plug in the APU gearbox.

#### I. Magnetic Drain Plug Installation Test

SUBTASK 49-91-81-860-007

(1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-81-860-008

(2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-91-81-790-002

(3) Do the installation test for the magnetic drain plug:

(a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

(b) Operate the APU for a minimum of five minutes.

(c) During the APU operation, examine the magnetic drain plug for signs of oil leakage.

(d) If you find oil leakage, do these steps to repair the leakage:

1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.

3) Repair the cause of the oil leakage.

4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

6) During the APU operation, examine the magnetic drain plug for signs of oil leakage.

7) If you find oil leakage, do the leakage repair again.

(e) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

#### J. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-81-410-002

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

(a) Remove the two retainer pins from the two hold-open rods in the APU compartment.

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- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

————— **END OF TASK** —————

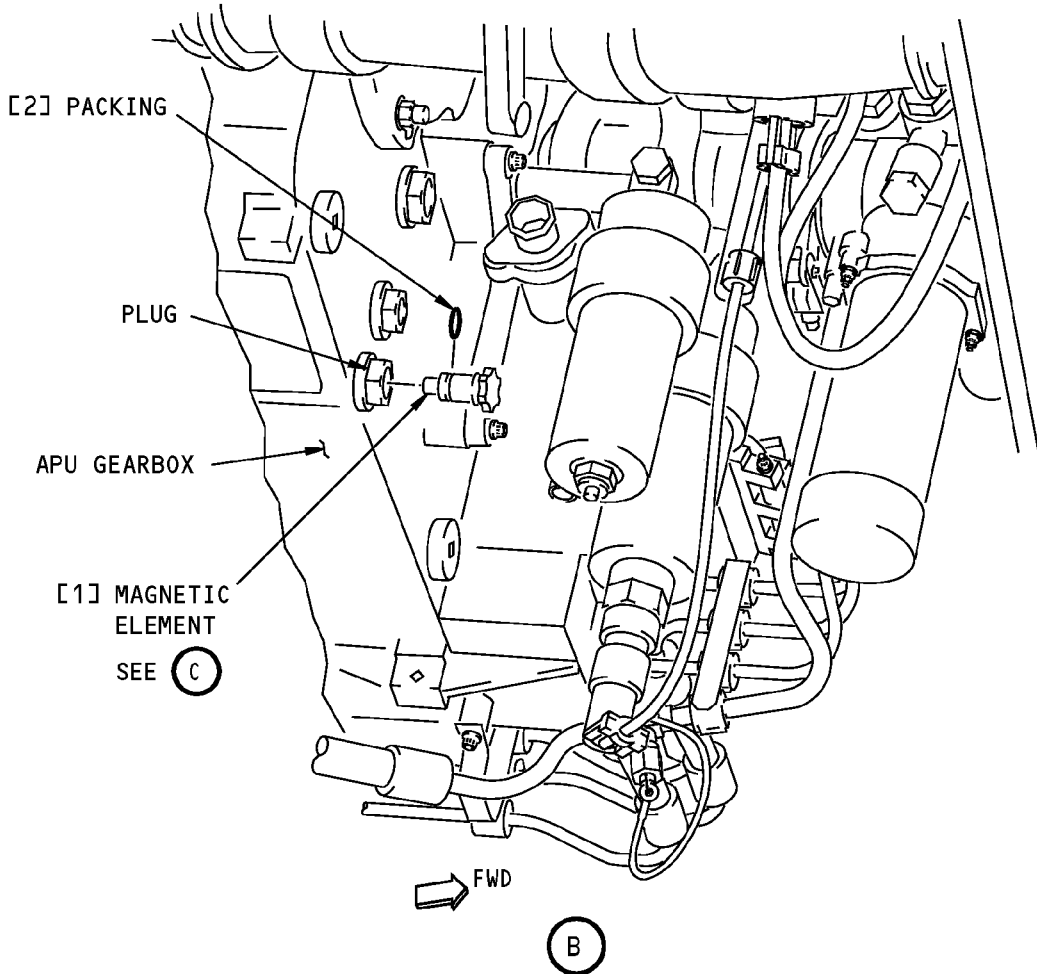
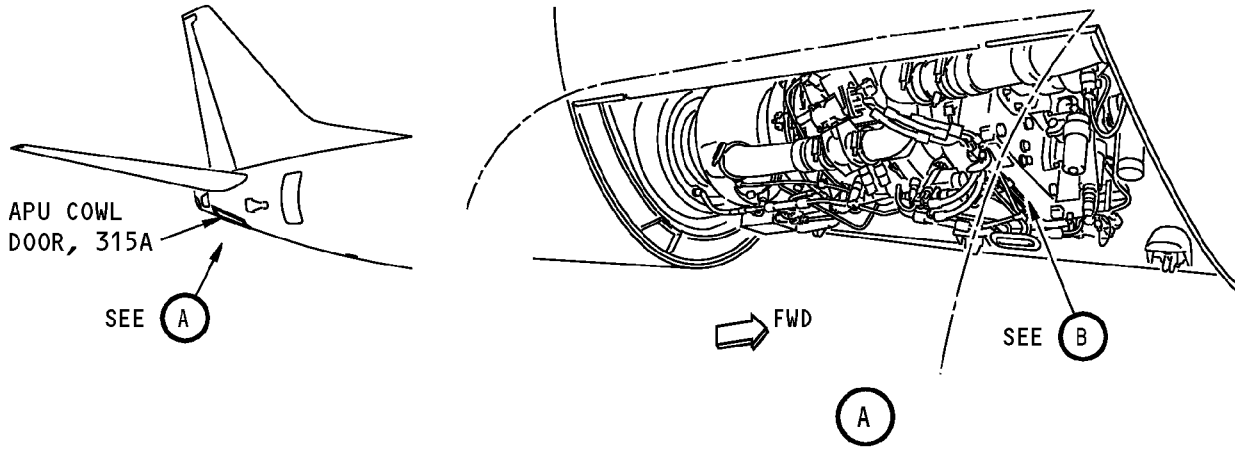
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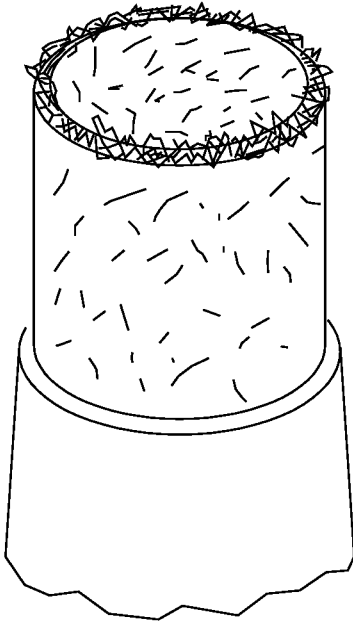
**Magnetic Drain Plug Inspection  
Figure 601 (Sheet 1 of 2)/49-91-81-990-802**

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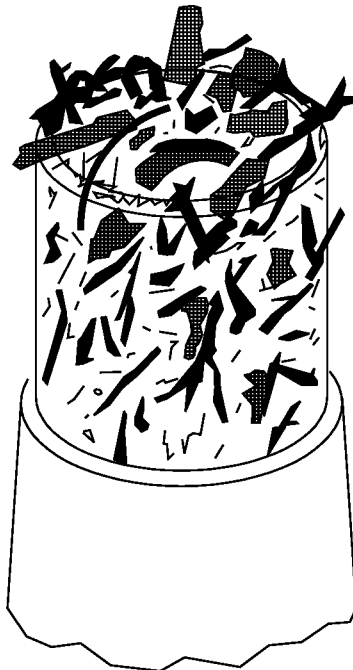
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SMALL QUANTITY OF METAL PARTICLES



MEDIUM QUANTITY OF METAL PARTICLES



LARGE QUANTITY OF METAL PARTICLES



Magnetic Drain Plug Inspection  
Figure 601 (Sheet 2 of 2)/49-91-81-990-802

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## AIRCRAFT MAINTENANCE MANUAL

### OIL LEVEL SENSOR - REMOVAL/INSTALLATION

#### 1. General

A. This procedure has these tasks:

- (1) A removal of the oil level sensor
- (2) An installation of the oil level sensor.

B. The oil level sensor is installed in the APU gearbox.

#### **TASK 49-94-11-000-801**

#### 2. Oil Level Sensor Removal

(Figure 401)

A. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left

B. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

C. Prepare for the Removal

SUBTASK 49-94-11-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-94-11-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-94-11-010-001

- (3) Open the APU cowl door:

- (a) Open the three latches.
- (b) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.

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- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
  - (g) Install the two retainer pins in the two rod ends.
- D. Oil Level Sensor Removal

SUBTASK 49-94-11-020-001

**WARNING:** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

- (1) Do these steps to remove the oil level sensor [2]:
  - (a) Disconnect the electrical connector (P16) [1] from the oil level sensor [2].
  - (b) Loosen the nut [4] on the APU gearbox.
  - (c) Turn the oil level sensor [2] counterclockwise until the flange disengages from the stud.
  - (d) Remove the oil level sensor [2].
  - (e) Remove the packing [3] from the oil level sensor [2].
    - 1) Discard the packing [3].
  - (f) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

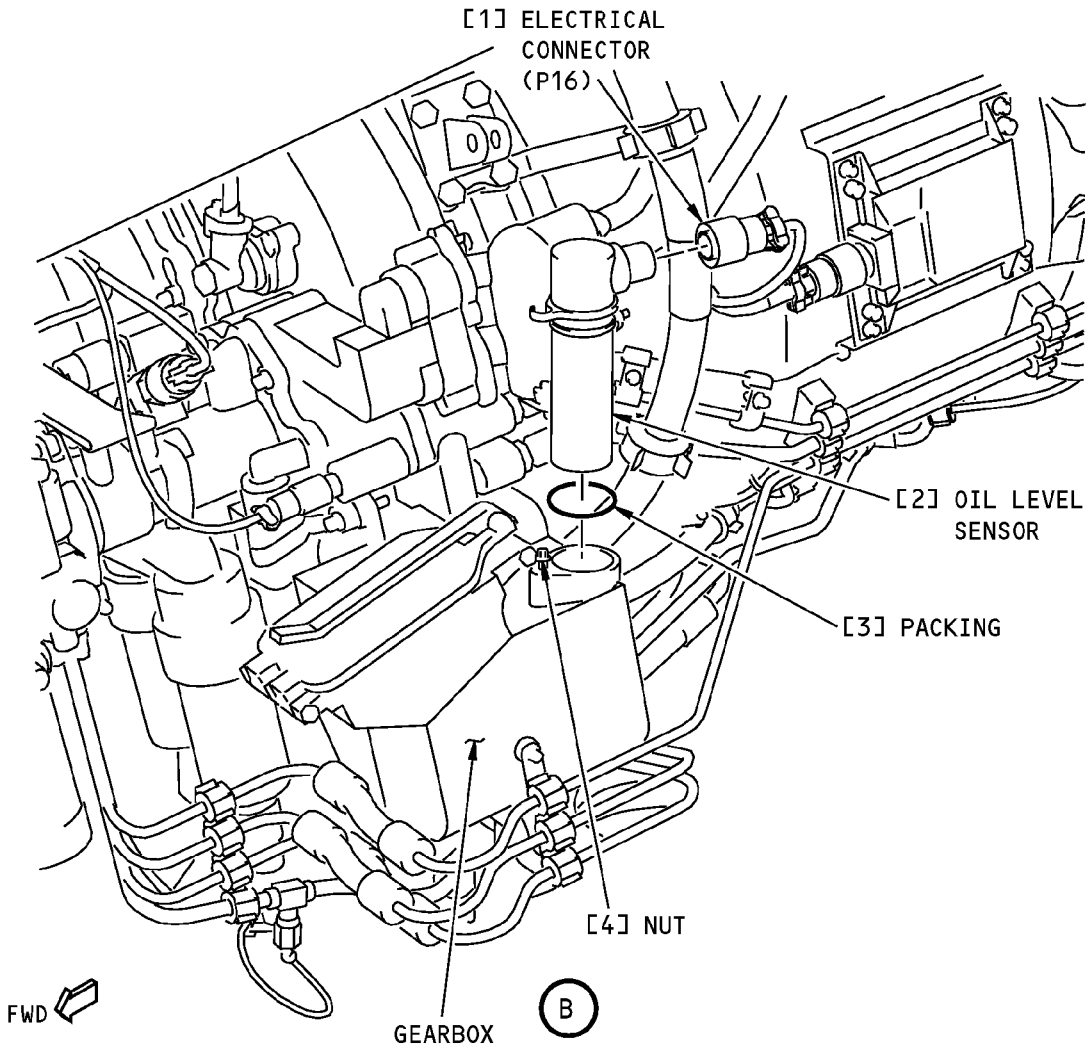
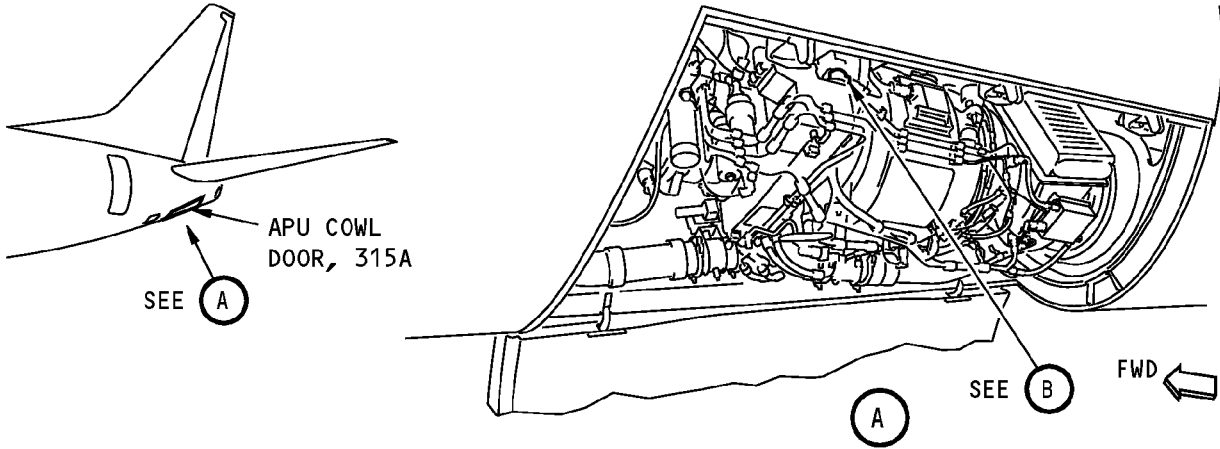
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**Oil Level Sensor Installation  
Figure 401/49-94-11-990-801**

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## TASK 49-94-11-400-801

### 3. Oil Level Sensor Installation

(Figure 401)

#### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

#### B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

#### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Oil level sensor	49-94-11-01-010	HAP 001-013, 015-026, 028-030
3	Packing	49-94-11-02-010	HAP 031-054, 101-999
		49-94-11-01-015	HAP 001-013, 015-026, 028-030
		49-94-11-02-015	HAP 031-054, 101-999

#### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

#### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

#### F. Procedure

SUBTASK 49-94-11-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

(1) Do these steps to install the oil level sensor [2]:

- (a) Lubricate the new packing [3] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.
- (b) Install the packing [3] on the oil level sensor [2].
- (c) Hold the oil level sensor [2] in the vertical position near the APU gearbox while you connect the electrical connector (P16) [1] to the oil level sensor [2].

**NOTE:** To do a BITE test on the LOW OIL QUANTITY indication for the oil level sensor [2], do not install the oil level sensor in the APU gearbox.

- (d) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

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- 1) Look at the OIL QUANTITY REPORT page on the control display unit (CDU) display for the oil level or the MAINTENANCE HISTORY page.
  - a) The OIL QUANTITY REPORT page shows LOW for the oil level.
  - b) The MAINTENANCE HISTORY page shows LOW OIL QUANTITY.
- (e) Install the oil level sensor [2] in the APU gearbox.
- (f) Turn the oil level sensor [2] clockwise until the flange fully engages the stud.
- (g) Tighten the nut [4] to 40 pound-inches (4.5 newton-meters).
- (h) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
  - 1) Look at the OIL QUANTITY REPORT page on the CDU display for the oil level.
    - a) The OIL QUANTITY REPORT page shows FULL for the oil level.

#### G. Oil Level Sensor Installation Test

SUBTASK 49-94-11-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-94-11-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-94-11-790-001

- (3) Do the installation test for the oil level sensor:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Operate the APU for a minimum of five minutes.
  - (c) During the APU operation, examine the oil level sensor for signs of oil leakage.
  - (d) If you find oil leakage, do these steps to repair the leakage:
    - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
    - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
    - 3) Repair the cause of the oil leakage.
    - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
    - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
    - 6) During the APU operation, examine the oil level sensor for signs of oil leakage.
    - 7) If you find oil leakage, do the leakage repair again.
  - (e) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-94-11-410-001

(1) Close the APU cowl door:

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (g) Close the three latches.

————— END OF TASK —————

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## AIRCRAFT MAINTENANCE MANUAL

### OIL TEMPERATURE SENSOR - REMOVAL/INSTALLATION

#### 1. General

A. This procedure has these tasks:

- (1) A removal of the oil temperature sensor
- (2) An installation of the oil temperature sensor.

B. The oil temperature sensor is installed on the lube module.

#### **TASK 49-94-21-000-801**

#### 2. Oil Temperature Sensor Removal

(Figure 401)

A. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left

B. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

C. Prepare for the Removal

SUBTASK 49-94-21-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-94-21-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-94-21-010-001

- (3) Open the APU cowl door:

- (a) Open the three latches.
- (b) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.

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- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
  - (g) Install the two retainer pins in the two rod ends.
- D. Oil Temperature Sensor Removal

SUBTASK 49-94-21-020-001

**WARNING:** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

- (1) Do these steps to remove the oil temperature sensor [1]:
  - (a) Disconnect the electrical connector (P15) [2] from the oil temperature sensor [1].
  - (b) Remove the oil temperature sensor [1] from the lube module.
  - (c) Remove the packing [3] from the oil temperature sensor [1].
    - 1) Discard the packing [3].
  - (d) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

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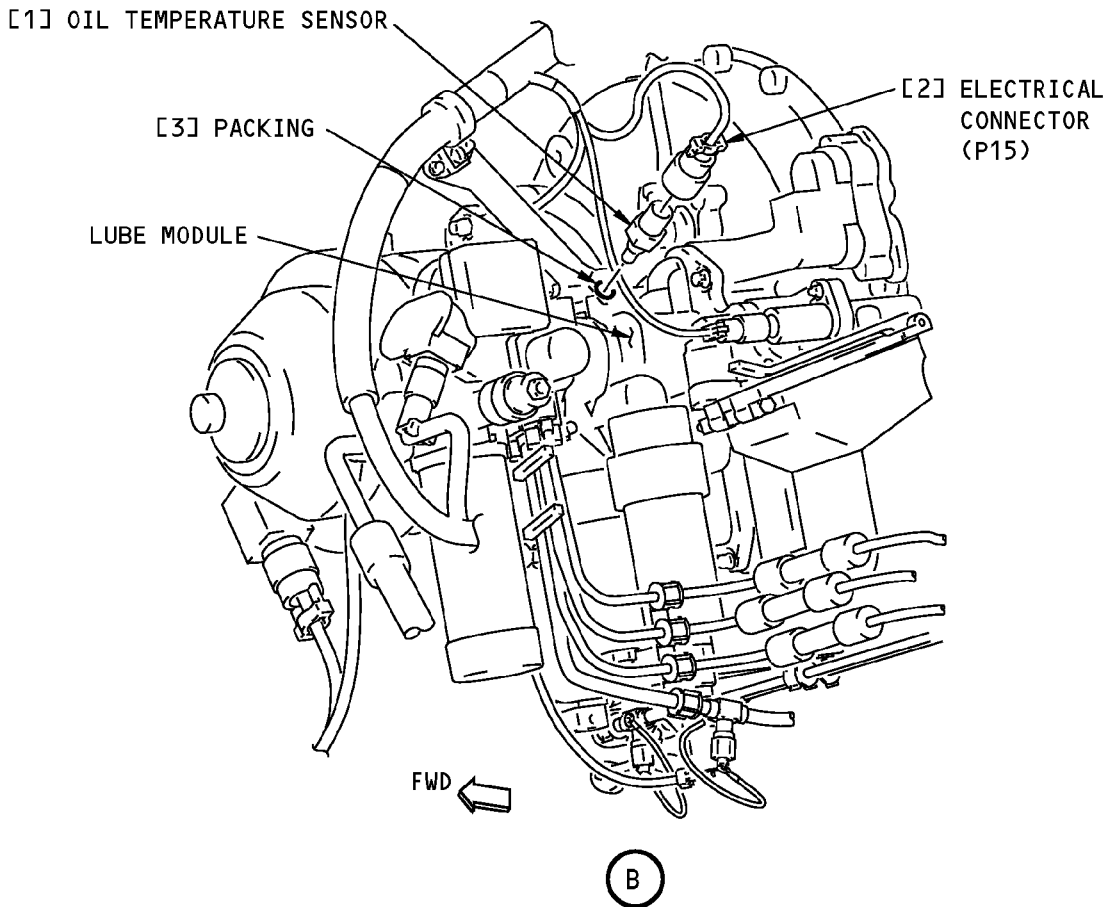
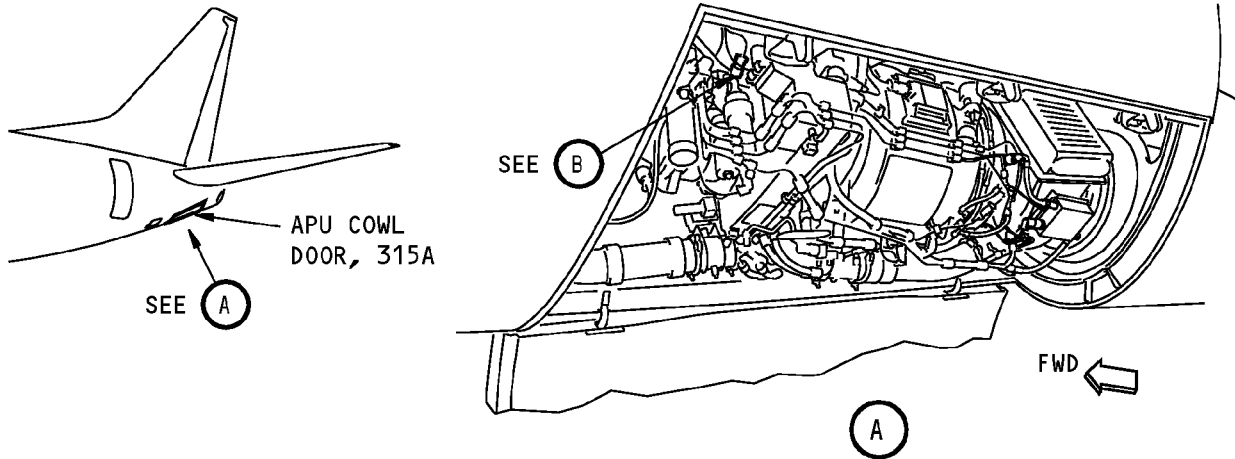
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**Oil Temperature Sensor Installation  
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TASK 49-94-21-400-801

#### 3. Oil Temperature Sensor Installation

(Figure 401)

##### A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

##### B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G01048	Lockwire - Corrosion Resistant Steel (0.032 In. Dia.)	NASM20995~ C32

##### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Oil temperature sensor	49-91-11-01-040	HAP 001-013, 015-026, 028-030
3	Packing	49-91-11-02-075	HAP 031-054, 101-999
		49-91-11-01-045	HAP 001-013, 015-026, 028-030
		49-91-11-02-080	HAP 031-054, 101-999

##### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

##### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### F. Procedure

SUBTASK 49-94-21-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the oil temperature sensor [1]:
  - (a) Lubricate the new packing [3] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.
  - (b) Install the packing [3] on the oil temperature sensor [1].
  - (c) Install the oil temperature sensor [1] on the lube module.
    - 1) Tighten the oil temperature sensor [1] to 65-70 pound-inches (7.3-7.9 newton-meters).
  - (d) Install the lockwire, G01048 on the oil temperature sensor [1].

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(e) Connect the electrical connector (P15) [2] to the oil temperature sensor [1].

### G. Oil Temperature Sensor Installation Test

SUBTASK 49-94-21-860-003

(1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-94-21-860-004

(2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-94-21-710-001

(3) Do the installation test for the oil temperature sensor:

(a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

(b) Operate the APU for a minimum of five minutes.

(c) During the APU operation, examine the oil temperature sensor for signs of oil leakage.

(d) If you find oil leakage, do these steps to repair the leakage:

1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.

3) Repair the cause of the oil leakage.

4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

6) During the APU operation, examine the oil temperature sensor for signs of oil leakage.

7) If you find oil leakage, do the leakage repair again.

(e) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

1) If maintenance message(s) show for the APU oil indicating system or the oil temperature sensor, refer to the applicable Maintenance Message Index in the FIM.

(f) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-94-21-410-001

(1) Close the APU cowl door:

(a) Remove the two retainer pins from the two hold-open rods in the APU compartment.

(b) Disconnect the two hold-open rods from the two brackets.

(c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.

(d) Install the retainer pin in the rod end of the forward hold-open rod.

(e) Install the retainer pin to the spring clip on the aft hold-open rod.

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(f) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

(g) Close the three latches.

————— **END OF TASK** —————

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LOW OIL PRESSURE SWITCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
  - (1) A removal of the low oil pressure switch
  - (2) An installation of the low oil pressure switch.
- B. The low oil pressure switch is referred to as the oil pressure switch.
- C. The oil pressure switch is installed on the APU gearbox.

**TASK 49-94-22-000-801**

2. Low Oil Pressure Switch Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-94-22-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO-NOT-OPERATE tag.

SUBTASK 49-94-22-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-94-22-010-001

- (3) Open the APU cowl door:
  - (a) Open the three latches.
  - (b) Open this access panel:

Number	Name/Location
315A	APU Cowl Door

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- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (e) Disconnect the two hold-open rods from the two spring clips.
- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (g) Install the two retainer pins in the two rod ends.

### E. Low Oil Pressure Switch Removal

SUBTASK 49-94-22-020-001

**WARNING:** DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

- (1) Do these steps to remove the oil pressure switch [2]:
  - (a) Disconnect the electrical connector (P14) [1] from the oil pressure switch [2].
    - 1) Install a cap on the electrical connector (P14) [1] to prevent contamination.
  - (b) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203 below the oil pressure switch [2].
  - (c) Loosen the nut [3] on the APU gearbox.
  - (d) Turn the oil pressure switch [2] clockwise until the flange disengages from the stud.
  - (e) Remove the oil pressure switch [2] from the APU gearbox.
  - (f) Remove the packing [4] from the oil pressure switch [2].
    - 1) Discard the packing [4].
  - (g) Make sure you install all necessary protection covers.
  - (h) Remove the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

————— **END OF TASK** —————

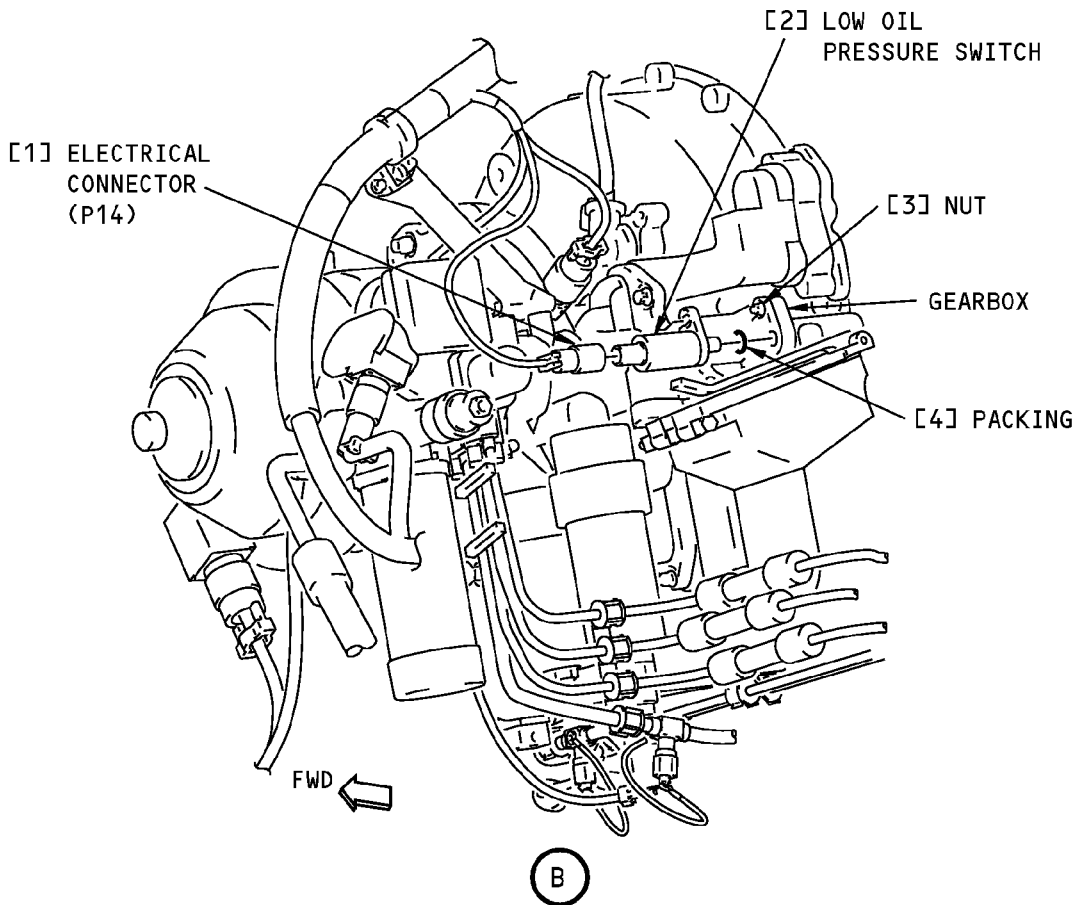
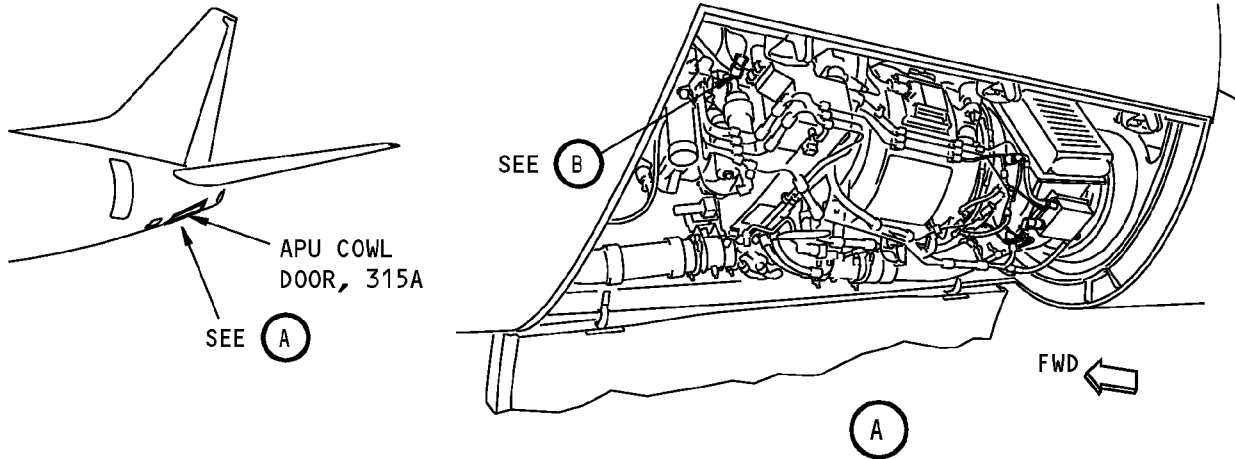
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### AIRCRAFT MAINTENANCE MANUAL

#### TASK 49-94-22-400-801

#### 3. Low Oil Pressure Switch Installation

(Figure 401)

##### A. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

##### B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

##### C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Oil pressure switch	49-94-22-01-010	HAP 001-013, 015-026, 028-030
4	Packing	49-94-22-02-010	HAP 031-054, 101-999
		49-94-22-01-015	HAP 001-013, 015-026, 028-030
		49-94-22-02-015	HAP 031-054, 101-999

##### D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

##### E. Access Panels

Number	Name/Location
315A	APU Cowl Door

##### F. Procedure

SUBTASK 49-94-22-420-001

**CAUTION:** REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the oil pressure switch [2]:
  - (a) Lubricate the new packing [4] with a light coat of Santovac 5 lubricant, D00341 or aircraft turbine engine oil, D50055.
  - (b) Install the packing [4] on the oil pressure switch [2].
  - (c) Install the oil pressure switch [2] on the APU gearbox.
  - (d) Turn the oil pressure switch [2] counterclockwise until the flange fully engages the stud.
  - (e) Tighten the nut [3] to 40 pound-inches (4.5 newton-meters).
  - (f) Remove the cap from the electrical connector (P14) [1].

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- (g) Connect the electrical connector (P14) [1] to the oil pressure switch [2].
- (h) Make sure the APU oil system is full. To check the oil level, do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.

#### G. Low Oil Pressure Switch Installation Test

SUBTASK 49-94-22-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-94-22-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-94-22-740-001

- (3) Do the installation test for the oil pressure switch:
  - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
  - (b) Operate the APU for a minimum of five minutes.
  - (c) During the APU operation, examine the oil pressure switch for signs of oil leakage.
  - (d) If you find oil leakage, do these steps to repair the leakage:
    - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
    - 2) Install a DO-NOT-OPERATE tag to the APU master switch on the P5 forward overhead panel.
    - 3) Repair the cause of the oil leakage.
    - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
    - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
    - 6) During the APU operation, examine the oil pressure switch for signs of oil leakage.
    - 7) If you find oil leakage, do the leakage repair again.
  - (e) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
    - 1) If maintenance message(s) show for the APU oil indicating system or the oil pressure switch, refer to the applicable Maintenance Message Index in the FIM.
  - (f) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

#### H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-94-22-410-001

- (1) Close the APU cowl door:
  - (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
  - (b) Disconnect the two hold-open rods from the two brackets.
  - (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.

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- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (g) Close the three latches.

————— **END OF TASK** —————

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